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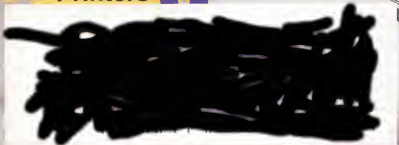
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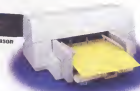
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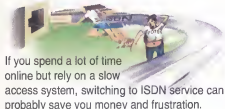
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TECHNOLOGY NEWS

Compiled by Cindy Krushenisky from AP and staff reports

The Internet Gets A Turboboost

After one trip down the Internet "Information Superhighway," you know just how slow and clunky your PC can be. It can take minutes to jump to an Internet address and download the images to your screen. But what if the Internet could give your computer a turboboost instead of dragging it down?

University of Virginia professors are designing software called *Legion* that would essentially turn the 'Net into a virtual "super" supercomputer, letting users harness the computational muscle of dozens, maybe hundreds, of PCs around the world, says Legion creator and Associate Professor of Computer Science Andrew Grimshaw. There is a huge amount of computing capability connected to the 'Net that goes unused. If the project is successful, users will be able to borrow from other people's machines for a burst of computer power.

Legion would act as middleware, or an intermediary between users and what they want to do. It also would be tailored to work with the several million institutional, business, and government computers that make up the Internet. Legion might let consumers access huge digital film libraries, doctors examine patients from anywhere on the globe, or scientists monitor the globe from a network of satellites. In fact, calculations that now take days could take minutes.

But Legion isn't unique. It's just one of four projects of its kind in the world. Two other efforts are under way in California and Illinois, while the third, in the Netherlands, is in the planning stage. Grimshaw says he would like to have a "usable" Legion system in operation by March 1997 and a more refined version ready by the time two new National Science Foundation supercomputer centers open in October 1997. Industry should follow right on Legion's tail. Within a year after Legion is up and running, Grimshaw expects commercial versions to be available. ●

Which Comes First?



It's another chicken-and-egg dilemma. Digital Video Discs (DVD) promise to replace CD-ROMs as the new storage standard, holding about 14 times as much data as CD-ROMs. However, makers of DVD drives and standalone players want assurance that there will be plenty of software for their products.

Software makers want to know there will be enough machines to justify their production expenses.

A lot is still up in the air. A technical specification for DVD had yet to be completed at the time this was written. Also, Congress must take up copyright legislation before some programmers and movie studios will feel comfortable producing DVD products.

It's difficult for companies to project what will happen. So far, Toshiba still plans to have systems ready by late 1996, while Philips has pushed back the availability date of its units until next

In The Statehouse



Legislation that backers hope will make Michigan a national model for cracking down on computer crime and telecommunications fraud was recently passed by that state's House of Representatives and moved to the Senate. The major focus of the eight-bill package was to give law enforcement specific charges with which to go after

"high-tech" criminals rather than leaving prosecutors searching for relevant statutes. The main bill would address computer trespassing by making it a crime to gain access to someone else's program or system without permission. Other portions prohibit using computer bulletin boards to publish or trade stolen phone and credit card numbers, child pornography, and obscene material. Yet another portion of the bill targets telecommunications fraud and the use of false names or the cloning of cellular phones. Prosecution would take place either where the crime was committed or where the computer used in the crime was located. Penalties are based on an escalating fine system and include forfeiture of the criminals' computers and telecommunications equipment instead of prison terms. ●

spring, Compaq also aimed to have PCs available by the end of the year that can play DVDs. But it's more difficult for software designers, particularly those who create games, to make the commitment. Because the discs hold so much data, games can incorporate more video. But since video is expensive to create, smaller game companies may be unable to keep up with larger rivals.

The problems are further compounded by the huge variety of uses for the discs. One disc can hold a two-hour movie, all of Beethoven's symphonies, or from 4.7 gigabytes (GB) to 17GB of information. Despite DVD's possibilities, many executives promoting the technology foresee that DVDs will be used the same way CD-ROMs initially were, holding large bodies of data, such as telephone listings or business records. Entertaining DVD games will emerge perhaps in late 1997 or 1998; anxious consumers may turn to an alternative technology before then. ●

Sold!

The Prodigy online service has a new owner and a new lease on life. Prodigy management, including President and Chief Executive Officer Edward Bennett, and International Wireless Inc. led the takeover from IBM and Sears. Grupo Carso, a Mexican industrial and telecommunications corporation, will act as a financial and strategic partner in the endeavor. Prodigy was founded in 1984 as a joint venture of CBS, IBM, and Sears to provide a home banking and shopping service. (CBS dropped out in 1986, two years before the first service, called Trintex, went online in Hartford, Conn.)

People And PCs



We bet the Hamburglar wishes he had a computer. This spring, people hungry for the \$1 million cash prize in McDonald's Disney trivia contest used the Internet to find answers to questions such as "In 'The Lion King,' where is young Simba first presented to his future subjects?" (Pride Rock.) The promotion probably cost McDonald's more cheeseburgers, Cokes, and apple pies than it expected, although there is no way to know for sure because the company didn't keep track of how much food was given away and wasn't aware of the online answers, according to a company spokesperson. Hundreds of people visited Internet sites specifically designed to supply answers. The contest's only \$1 million prize winner, a Nebraska teen-ager, got the right answer about black-and-white Mickey Mouse cartoons without using the Internet. Nonetheless, the contest demonstrated how information can be pulled together quickly and shared on the Internet. The sweepstakes also showed the advantage of owning or having access to a computer, even though the payoff may have been just a free Quarter Pounder.

Imagine your surprise if you called your bank to be told by an automated voice teller that your checking account balance was \$924,844,208.32. More than 800 customers of First National Bank of Chicago were mistakenly made richer by that amount in a \$763.9 billion computer glitch this spring. No, no one got to keep the money, and most of the customers didn't even know they had the extra cash. The American Bankers Association said it was the largest such error in the history of U.S. banking. The total amount was more than six times the total assets of First Chicago NBD Corp., the bank's holding company. While the bank worked feverishly to correct the problem, it temporarily froze the accounts. The problem was attributed to a change in a computer program.

A diagnosis for Andy Peake's ailing children didn't come from traditional or alternative doctors, who for six years offered no answers. It came from the Internet. Peake of Portland, Ore., began his search for the cause of the illness by exploring the medical library at Oregon Health Sciences University. He also bought medical dictionaries and books. Then he turned to the Internet. Eventually, he tried a search based on his son Ethan's symptoms: general muscle weakness, droopy eyelids, ophthalmoplegia, intermittent respiratory distress, and delayed motor development. In the four or five articles that appeared, he found one about myasthenia gravis (CMG), a neuromuscular disease that strikes just one or two people in a million. There's no cure, but medication has put 6-year-old Ethan in the best shape of his life. Although the medication has been less effective for nearly 1-year-old sister Annelise, doctors think it might help as her nervous system develops. Although family research turned out positively for the Peakes, doctors still warn people to be wary of cyberquacks, salespeople, and data without scientific basis. ●

Even with the ownership obstacle behind it, Prodigy still has quite a battle ahead. Prodigy was the second-largest online service in early 1995 with about 1.25 million subscribers, while CompuServe had 2 million and America Online had 1 million. Now, however, America Online has at least 5 million subscribers and CompuServe 4 million, while Prodigy has stood still.

While the online service must invest heavily in new systems and marketing to keep pace, officials say they also plan to expand Prodigy's Internet offerings and tap into markets abroad. ●

Digital Paleontology



While it's a far cry from "Jurassic Park," computer simulations may help resolve some dinosaur speculation. Currently, scientists are using computers to find out what sound might have been made by a 75-million-year-old duck-billed dinosaur whose skull was unearthed in northwestern New Mexico.

Researchers measured the nasal passages that loop back and down the dinosaur's great crest in a configuration somewhat similar to the brass tubing of a trombone. The measurements were then fed into a computer, which calculated that the sound the dinosaur could make had to be below 10 hertz (Hz), or 10 vibrations a second, which is too low for humans to hear but would carry over long distances.

The researchers are moving ahead with a computer model, which will be a reconstruction of the proper dimensions of the nearly intact skull before it was distorted by fossilization. The work began early this year when the skull was examined by a three-dimensional X-ray machine. Once the model is finished, scientists can simulate how the crest material would behave. Eventually, they hope to use super-computer simulations to re-create the voice, perhaps discovering the Parasaurolophus made sounds that would be audible to humans.

Tom Williamson, New Mexico Museum of Natural History and Science paleontologist, says with this type of digital paleontology, computer simulations can replace physical tests that once would have been performed on the skull. The benefit is that scientists don't have to destroy the specimen to do their research, and it gives them more detail than possible with previous methods. Someday, such advanced computer methods may become the standard for figuring out all kinds of paleontological puzzles. ●

The Ideal Internet Access Device

France's Minitel network, which lets French users send E-mail, read the paper, book flights, and get instant soccer scores, caught on much faster there than the Internet has in the United States. Why? One convincing reason could be the access devices. There, Minitel terminals are provided for free or rented cheaply by France Telecom. Here, a new PC costs around \$1,500 to \$3,000.

But what if you could access the Internet much more cheaply? Industry giants IBM, Sun Microsystems, Oracle Corp., Apple Computer, and Netscape Communications recently proposed a

standard profile for low-cost Internet computers. Under the name **Network Computers**, or NCs, the systems would do many popular computer tasks such as writing letters, sending E-mail, creating spreadsheets, and surfing the Internet for as low as \$500.

What's been proposed—the NC Reference Profile 1—is actually just a set of standard features and functions the companies think should be included in Internet access devices. The devices may take one of many forms, from laptops and videophones to pagers and even conventional PCs. While the units will have to support Java applications (programs designed to run with any computer or operating system), there's no requirement to run Microsoft Windows-compatible software. The units probably won't require diskette drives or CD-ROM drives because they'll make users "rent" software from a network.

The ultimate goal is to make NCs as commonplace and affordable as a television or telephone. The NC Reference Profile 1 was expected to be finalized in August after public review. Also during the third quarter of '96, the companies plan to establish a World Wide Web site where prospective units could be tested for compliance. Manufacturers who meet the criteria then could promote their devices as NC Profile-compliant and carry the NC logo. ●

Tech Shorts



The United States is only one contender in the race for interactive television. The first European field test of an interactive TV system got under way this summer, bringing digitized videos on demand and high-speed Internet access via TV to 10 Munich, Germany, households. Some 22 European companies, research institutes, and telecommunications organizations are involved in the Advanced Multimedia Services for Residential Users (AMUSE) trial, which will be tested further in other European cities, including Basel, Switzerland, and Mons, Belgium. Another interactive television test is under way by the Tokyo Metropolitan Government at the Tokyo Teletext Center. The cable system will be used to try video on demand, as well as multimedia public services and remote services, such as health consultation and education. . . .

Java, Java everywhere. The Internet programming language by Sun Microsystems has been licensed to be built into just about every environment you can think of. Companies such as Apple, Hewlett-Packard, Hitachi, IBM, Microsoft, Novell, Silicon Graphics, and Tandem Computers all intend to embed Java in their operating systems. What exactly does Java do? It lets people add features, such as animation, to electronic documents and applications distributed on the World Wide Web without requiring a special software add-on to operate them. This means that programs written using the Java language can run in just about any operating system, crossing all kinds of boundaries. It also means that no operating system will have an edge over the others when it comes to the kinds of Internet applications they can run. ●

Product Previews



BUMPER-TO-BUMPER BLACKJACK:

By now you've probably heard about the in-car navigation systems that display mapping information on your dash. They're great for helping you get where you're going. But what about the time you spend sitting gridlocked during rush hour? You don't really need a map when you're inching along familiar roads in bumper-to-bumper traffic.

Amerigon has a unique idea. In addition to mapping your route with Amerigon's Interactive Voice System, you also can use it to play games. *Blackjack* will be Amerigon's first IVS gaming application, available this summer.

Blackjack takes advantage of the voice-activated features of the interactive navigation system, allowing users to hit, stand, split, double-down, and even increase and decrease bet amounts through spoken commands. The game software actually assumes the persona of a Blackjack dealer, announcing card draws and asking players what they'd like to do. Everything is done verbally so drivers never have to take their eyes off the road.

The IVS system installs directly into compatible CD car stereo systems. IVS units are available nationwide for about \$600 to \$700, while a price for the *Blackjack* game had not yet been established when *PC Novice* went to press. (The mapping software is about \$80 per area.) For more information, contact Amerigon at (818) 932-1200.

TVs TAKE THE INTERNET: Couch potatoes, break out your surfboards. Zenith Electronics Corp. recently unveiled a line of large-screen color TVs that let viewers surf the Internet and access E-mail, as well as watch regular television programming.

Using a technology by Diba Inc. for finding information on the Internet, the 27-inch and larger NetVision TVs should range in price from less than \$1,000 to more than \$2,600, which is about \$400 to \$600 more than a comparable TV. While they don't have as much computing power as a PC, NetVision TVs include a built-in modem and an infrared trackball remote control, or users can use an optional wireless keyboard. (For more information, contact Zenith's public relations office at 847/391-8100.)

But Zenith's NetVision TVs, which should be available in the fall, don't have the TV/PC market cornered. Gateway 2000 earlier announced a \$3,800 entertainment system/full-featured computer with television capabilities called the *Destination*. Thomson Consumer Electronics also has introduced an RCA Genius Theater prototype, complete with Internet access and other computer functions. ●

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NOVICE NOTES

The Survey Says . . .

While researching stories, we often run across surveys and studies that contain nuggets of valuable information. Even though these "factoids" may not always find their way into our articles, they're still interesting.

For instance, did you know:

- There are approximately 40 million places to visit in cyberspace. — *From information released with a survey by CMG Information Services Inc.*

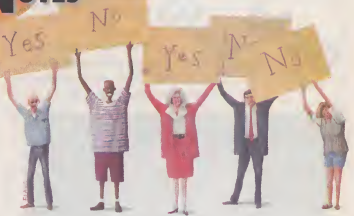
- About 50% of desktop computer owners in a recent survey said they expected to replace their desktop units with a portable PC in the next two years. — *From a Datapro Information Services Group survey.*

- People today are using a computer for personal purposes an average of 11.4 hours a week.

That is up from 8.5 hours a week last year. — *From a survey of 4,500 consumers and 13 focus groups conducted by Odyssey.*

- Experts predict the worldwide personal computer market will grow 19% in 1996, down from 1995's impressive growth rate of more than 25%. Manufacturers shipped \$125 billion worth of PCs in 1995. — *From a survey of 30 computer manufacturers conducted by Dataquest.*

- A total of 17% of the persons responding to a recent online survey said they spent more than 40 hours a week on the 'Net. The survey's average respondents said they spent 21 hours a week in cyberspace, about 31% said their work habits had suffered as a result of their 'Net habit, and 11% said if it wasn't for their PC, they



wouldn't have any fun at all. — *From a survey conducted by psychology student Viktor Brenner for his doctoral thesis.*

- In 1995, about 60% of those surveyed said their business computers were still running Windows 3.x and only 14% said their PCs were running Windows 95. Predictions for 1996 show Win95 gaining some ground with about 30% of business computers using

it, while Windows 3.x usage will drop to about 54% of business PCs. — *From a Global IT survey conducted by International Data Corporation (IDC).*

- About 54% of the people currently using the Internet or online services said they spend more time searching for information than actually finding and using it. — *From a telephone survey of 1,000 persons sponsored by Lycos Inc.* ●

We know that hands can feel cramped after a long day of mousing and keyboarding. And maybe we do need extra support to prevent the onset of repetitive stress injuries (RSIs). But if recent offerings of ergonomic mice and mice "add-ons" are any indication, we're still in for a wait.

ErgoGear Inc.'s MouseMate, a soft rubber palm support, is intended to keep your wrist in a neutral position, forcing you to use your arm muscles instead of straining your hand and finger muscles. The MouseMate, available for less than \$10 at computer stores, affixes to a mouse with Velcro.

All we can say is nice try, but . . . While the additional support was surprisingly comfortable, the device presented other problems: It consumes already-crowded desk space and doesn't fit all mice. If mice supports are to be effective,

In Search Of A Better Mouse



The MouseMate (right) and the Alps Adjustable Mouse are two offerings of ergonomic mice.

they either need to be included in the original mouse design or fashioned as brackets into which mice can be slid. (There should be models for different brands as well).

Aimed to fit several hand sizes, the Alps Adjustable Mouse from Alps Electric Inc. offers three programmable buttons and the ability to slide the shell over the mouse body into higher positions to

accommodate larger hands. The shell itself offers a shape that curves more than other mice. Several people in our office found it generally more comfortable. The adjustability was a change welcome to those with larger hands but wasn't necessarily enough to make the testers run out and buy one immediately. We do think, however, that it would be a good

addition to family computers used by kids and adults.

The Alps software lets users customize mouse settings, including pointer sizes and tracking speed. For some users, the Alps Adjustable Mouse just might be worth the \$39.95 list price; less finicky users will stick with what they have. The Alps Mouse, available in PC and Macintosh versions and two colors, can be bought in computer chain and superstores with a 6-foot cable and PS/2 and serial adapters.

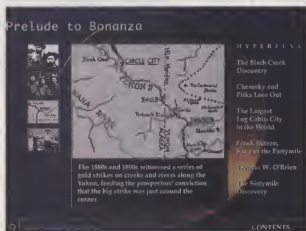
For More Information:

Alps Adjustable Mouse
Alps Electric Inc.
(800) 825-2577
(408) 432-6000

MouseMate
ErgoGear Inc.
(800) 888-3537
(212) 867-0661 ●

Gold
Rush!

The features in the
Klondike Gold CD-ROM
include interactive photos,
maps, and hypertext links.



One hundred years ago, the world's last great gold rush, the Klondike Gold Rush, began, bringing a flood of 80,000 people to the Yukon. Now, on the gold rush's centennial anniversary, a CD-ROM can help you learn about the Klondike's history before, during, and after the gold rush. *Klondike Gold*, an interactive history program, includes photographs, maps, and other illustrations; movies; narration; and three-dimensional (3-D) animation.

The main screen is a pan similar to those used by prospectors panning for gold. As you move your cursor over a gold nugget, an icon appears for one of the program's sections. There are five sections, with three focusing on the history of the area. The history sections contain text, photographs, and narration on many aspects of life in the Yukon, from the lives of the prospectors to the media coverage of the gold rush around the world. When you enter one of these sections, a slide show begins, with narration about the time period you chose. Clicking the pictures provides more information about the topic.

A fourth section contains information about the mining process, including a 3-D illustration of a dredge. You can click numbered parts to learn their functions and watch video clips of them in action.

One of the most interesting sections of the program is "The Cremation of Sam McGee," a poem about life in the Yukon by Robert Service, the "bard of the Yukon." In this section, you can hear the poet himself in a 1941 recording of the poem (while watching an illustration slide show), listen to a radio interview with the poet, or read background information about the poem and author.

Hypertext links and icons make it easy to navigate this program's material and move from one topic to another. At a suggested retail of \$39.95, this program offers history buffs enough information to keep them entertained for hours.

For More Information:

Klondike Gold
DNA Multimedia Corp.
(800) 797-3303
(604) 730-0306 ●

The Global Village
Gets A Little Smaller

The World Wide Web and the Internet have been bringing us closer to a universal language. Now, Globalink has a product that brings the language to us.

Web Translator is an easy-to-use Web browser add-on designed to translate French, German, and Spanish Web sites into English (or vice versa). Within two minutes of installing the program, we were translating French Web sites into English with ease. You even can move back and forth between the translated and original pages and click the access links as you would on a normal Web page.

The translations are a little "loose" at times, although Web Translator does a good job of coming close to the actual meaning of a word or phrase. This slight variation makes for some interesting translations, but you'll certainly be able to get the gist of the content.

The program will translate English into and from French, German, or Spanish, but it will not go from French to German, etc. Any text in the graphics won't be translated either, but this didn't prove to be much of a problem because many Web sites come with a text-only listing.

The program, with a suggested retail price of \$49.95, also includes

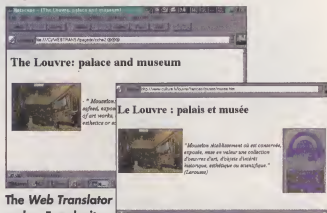
a listing of foreign language Web sites with links so that you can begin using the Web Translator right away.

Other products on the market do similar things. When PC Novice went to press, Accent Software International was planning to unveil *Multilingual Plug-in* for Netscape's *Navigator* in late summer. Similar to Web Translator but on a much grander scale, this product would make it possible to handle more complex translations. For example, you will be able to translate Arabic Web pages in a Russian Windows suite. The plug-in would be the latest component in Accent's *Internet With An Accent* multilingual Internet suite with a capacity to handle more than 30 languages. The suite costs about \$99.

For More Information:

Web Translator
Globalink Inc.
(800) 255-5660
(703) 273-5600

Multilingual Plug-in
Internet With An Accent
Accent Software International
(800) 535-5256
(714) 223-0620 ●



The Web Translator makes French sites, such as this one at the Louvre in Paris, readable to English speakers who can't decipher the "language of romance."

Microsoft Continues 'Net Exploration

Microsoft's got the Internet religion, and it's starting to make a few offerings at the altar of Users.

The latest version of the software king's World Wide Web browser, *Internet Explorer 3.0*, is now available in beta form at <http://www.microsoft.com>. The updated program features support for many Web elements that were visible until now only to browsers such as Netscape's *Navigator*.

Chief among these features are frames, a way to display multiple Web pages in the same browser window. Competent use of frames by Web designers can make navigating a site easier. The new Explorer also includes the capability to restrict the display of Web sites voluntarily using a new rating system. Parents can set the

browser according to their tastes in an attempt to keep their kids clean.

Lacking in the version available at press time was support for Java, the evolving programming language of the Internet. Java applets are small programs that download with Web pages into browsers such as Netscape, adding life to previously static displays. The final version of Explorer 3.0, however, will support Java, Microsoft says.

Along with the Web browser, Microsoft also introduced a pair of other beta programs, *Internet Mail* and *Internet News*. Both are designed to work with Explorer to give users simple access to E-mail and Usenet newsgroups, the bulletin boards of the Internet.

We found Internet Mail a much easier E-mail solution for home

Microsoft's new Internet Explorer 3.0 beta includes an updated interface.



users than Microsoft Exchange, the unwieldy, full-featured program that comes with Windows 95. It's certainly less of a challenge for the new user to set up Mail rather than Exchange. The biggest problem we saw was the beta version's inability to automatically dial an Internet provider, retrieve mail, and hang up the phone. It would seem odd if this isn't changed by the final release.

All three applications are welcome additions to the Windows desktop. The interfaces are a bit of a departure from the long-standing Microsoft reliance on toolbars.

Most of the tiny buttons have been replaced with larger icon areas that, in Explorer, change color as the mouse pointer moves over them. The overall effect is more attractive and less confusing. The software has a few glitches, but this is one beta worth a look.

For More Information:

Internet Explorer 3.0
Internet Mail
Internet News
Microsoft Corp.
(800) 426-9400
(206) 882-8080 ●

Business Cards, Stationery, And Post-It Notes, Oh My!



If the lack of a professional appearance is the only thing keeping your business down, the *Business Image Bundle* from T/Maker Company may just be what you need to get off the ground.

The package, which sells for \$35, includes everything you need to design and print your own business cards, stationery, memo pads, Post-It notes, address stamps, and endorsement stamps. As part of T/Maker's "World's Easiest" line, the program walks you through the entire process, providing hints along the way.

This product comes with eight different styles of decorated paper if you want to try it out on your own printer. Since we just happened to have a printer lying around while we were working on this issue, we decided to put

this bundle to the test on a Canon BJC-70 color inkjet printer.

For our test, we designed several business cards and stationery sets. Using the program was exceptionally simple. We had no problem choosing a layout or modifying the text and logo on the business cards and letterheads to meet our needs.

One problem we did have was with the program's simplicity. We

couldn't move the text and logo around after we picked a layout. We had plenty of built-in layouts to choose from, and they looked good when all of the information fields were filled in (name, company, address, etc.). But if we left some fields blank, we ended up with white space on the cards and an unbalanced appearance. We also were limited in our choice of designs that wouldn't conflict

with the color schemes on the decorated paper (we didn't want to overlap text with preprinted images).

When we chose an appropriate layout and balanced the information fields, the final product looked professional. The business card paper was a little thin, but the stationery was high-quality. The matching letterhead on the paper and the envelopes would have impressed any receiver.

The *Business Image Bundle* is probably well within the world's easiest to use, but a little more complexity might have made it the world's most efficient.

For More Information:

Business Image Bundle
T/Maker Company
(800) 966-2537
(415) 962-0195 ●



In *Where's Waldo? Exploring Geography*, kids listen to audio clues about landmarks, then mark the appropriate landmark with a human javelin.

Waldo Takes You 'Round The World

Where's Waldo? *Exploring Geography* shows that a scavenger hunt is one good way to learn about new territory as it takes children on a hunt for the athletes of the Wacky Worldwide Games. In each continent, children must play geographical games to figure out who will win the Games.

This program does an excellent job of including different aspects of geography. The product teaches basic lay-of-the-land lessons with a soccer game, Kick For A Country. After children kick the ball into the net, they get to match the country named with one of the shapes lying around the perimeter of the map. The easy level of play provides an outline of each country while the most difficult level offers just a continent outline map as a test of the depth of the child's knowledge.

The Human Travelin' Javelin game offers factual information about a continent's landmarks and the culture of its nations. The child listens to a little background information as well as a clue and then tries to locate the object, landmark, person, animal, etc., marking it with a human javelin. The idea is a little odd, but it's one of the more interesting games in this application. The lower level

provides a bull's-eye target on all the target objects, but as kids move up and gain more confidence, the giveaways can be turned off.

This product includes map reading along with its basic geography lessons. The package includes a game, The Road Rally Relay, that challenges children to choose whether to travel from one place to another by air, land, or water based upon the terrain and weather reports.

Where's Waldo? *Exploring Geography*, which sells for about \$30, completes the package with a lesson on longitude and latitude. Children match flags to their countries by using longitude and latitude coordinates to place them.

All of these lessons are tied together by the popular Waldo search-and-find puzzles. Each continent is represented by a conglomeration of colorful images that adds to the geography fun.

For More Information:

Where's Waldo? *Exploring Geography*
WarnerActive
(800) 856-1351
(310) 581-5820 ●

NOVICE NOTES

The Learning Libraries

Creating a software library for your child just got a little easier. Broderbund Software has announced a new deal in which the company bundles together some of its more popular CD-ROM programs into "Learning Libraries."

For a price of about \$75, *Learning Advantage Library 1* targets children ages 3 to 7, building reading, math, geography, art, and creativity skills. Along with *Carmen Sandiego Junior Detective Edition*, you get the *Kid Pix Studio* paint and drawing package complete with stamp figures, sound effects, and animation. In addition, *In The Playroom* lets kids discover letters and learn basic math, while *James Discovers Math* adds more activities that teach numbers, time telling, and patterns.

The *Learning Advantage Library 2*, for about \$75, also teaches a range of skills but to a little older audience: children ages 6 to 13. Kids get *The Amazing Writing Machine* word processor as well as *The Reading Galaxy* to help develop reading comprehension through a game show that's out of this world. Of course, there's also a copy of *Where In The USA Is Carmen Sandiego?* for amateur geography sleuths, and kids can build logical thinking skills in the *Logical Journey of the Zoombinis* as

they help Zoombinis escape past thought-provoking obstacles.

If it's only creativity you want to nourish, Broderbund's *Creative Advantage Library* bundles the *Kid Pix Studio* with *The Amazing Writing Machine*. It's a great deal for children ages 3 to 12, for a price of about \$50.

For children ages 9 and older, the *Carmen Advantage Library*, for \$50, packs together two popular Carmen titles—*Where in the World is Carmen Sandiego?* and *Where in the USA is Carmen Sandiego?*—with a comprehensive atlas called *PC Globe Maps 'n' Facts*. Once you "discover" a country through the games, you can learn more factual information in the atlas.

All of the titles are new, popular programs that are entertaining; this isn't a case where the company bundled some of its less prevalent products with big sellers to market more copies. And it seems to be quite a deal. When we added up how much it would cost to purchase each package separately, you often ended up getting a product for free.

For More Information:

Learning Library series
Broderbund Software
(800) 521-6263
(415) 382-4400 ●



Entertaining programs, such as the *Logical Journey of the Zoombinis*, are included in the Learning Libraries, making the software bundles quite a deal.

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Break

Config.sys Commands For Your Keyboard

Switches

Gleason

Whether you're a power user or a neophyte in the computing world, you can use DOS commands to set up your computer just the way you want it. Many of the commands referred to as you learn about DOS are a little on the strange side and probably won't be employed much by the average PC user. There are special cases, however, when you may want to fine-tune your computer's behavior as much as possible through the Config.sys file.

■ Changing Config.sys

NOTE: Before changing your Config.sys file, make a backup copy of it in case you run into problems and need to restore the original file.

To change your Config.sys file, type **edit** at the **C>** prompt and press **ENTER** to run the MS-DOS Editor. Once the Editor starts, press **ESC** to clear the introductory dialog box, then press **ALT** to activate the menu bar. The **File** menu should be highlighted; press **ENTER** to open it. Use the **Down** arrow to reach the **Open** option and press **ENTER** again. The **Open** dialog box appears. Use the **Backspace** key to delete what appears in the **File Name** text box and type **config.sys** in its place. The **OK** command at the bottom of the **Open** dialog box should be highlighted; press **ENTER** to accept it and open the Config.sys file. Use the arrow keys to move between lines in the file. (If you're adding a line to the file instead of changing an existing line, use the **Down** arrow until you're on the first empty line after the existing lines in the file and type in your new line.)

Once you've made your changes, activate the menu bar by pressing **ALT** again. Choose **Exit** from the **File** menu; you'll get a prompt asking whether you want to save the loaded file. The **Yes** option should be highlighted; press **ENTER** to accept this option and save the Config.sys file with the new information. To have the new setting take effect, restart your computer.

NUMLOCK. How many times have you tried to enter numbers using the numeric keypad on your keyboard, only to find that the digits you typed didn't reach the screen because the NumLock key was turned off? Well, it doesn't have to be that way. To avoid this problem, you can add a line to your Config.sys file to determine whether NumLock is on or off when your PC starts. (Use the directions above to open and change your Config.sys file for all of the following commands.)

The **NUMLOCK** command in DOS versions 6.0 and newer determines whether the NumLock (Numbers Lock) feature is on or off when you start your computer. To set it so that NumLock is off when you start your computer, add a line reading

```
numlock=off
```

to your Config.sys file. To change it back so NumLock is on when you start your computer, change that line to read

```
numlock=on
```

or delete the **NumLock=** line from your Config.sys file. The NumLock light on your keyboard (in some cases on the key itself) will be on if the feature is on and off if it's turned off. (During startup, the light may come on briefly even if the feature is turned off, but the light will go off again after a moment.)

BREAK. The **BREAK** command determines how often DOS checks to see whether you've pressed **CTRL-C** to stop a program or an activity such as file sorting. Normally, DOS only checks for this key combination when information is being read from the keyboard or written to the screen or printer, not during disk read-and-write operations. For example, if you were printing a 20-page document and wanted to stop mid-print, you could hit **CTRL-C** to cancel this operation. However, **CTRL-C** won't let you interrupt an operation such as opening a large file. You can make DOS check to see if this key combination has been pressed during disk read-and-write operations by entering a line reading

```
break=on
```

in your Config.sys file. To go back to the original setting, just change the line to read

```
break=off
```

instead or remove the line from the file altogether.

SWITCHES. The **SWITCHES** command specifies special options for MS-DOS. One variation, **switches=/k**, makes your enhanced keyboard perform similar to a conventional keyboard. Why would you want to go backward like that? Well, though we admit it's unlikely, you might run across an application that doesn't correctly interpret information entered from an enhanced keyboard. If you do find a program like that, you can add the command

```
switches=/k
```

to your Config.sys file to force your keyboard to act like a conventional keyboard. To change it back, just delete that line from your Config.sys file. ●

by Diana K. McLean

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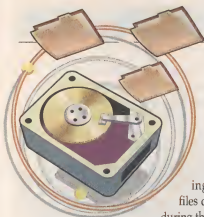
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Managing Temp Files

Sometimes it only takes a little knowledge to avoid a big headache. Knowing a few facts about temporary files can minimize your chances of enduring the problems these files may cause.

A temporary file, or **temp file**, is a means of protecting data files from accidental manipulation, corruption, or deletion. When a user retrieves a data file from a storage device, the application with which it is associated automatically generates a temporary copy of it. This copy—the temp file—is the version actually manipulated by the user. The original data file remains unaltered until the user saves the temp file under its original file name. After the file has been saved and its associated application has been properly closed, the application then automatically deletes the temp file from the computer.

During their short lives, temp files are stored in a **temporary directory**. The default temporary directory in many computers can be found in the WINDOWS directory at C:\WINDOWS\TEMP or in the DOS directory at C:\DOS\TEMP. A few applications don't recognize these default directories, though, and some computers don't have a temporary directory. Under these circumstances, the temporary files are automatically saved to the **root directory**. (A root directory is the primary directory on a computer. It's the directory that links to all the installed applications and system files.)

Most of the time, it doesn't matter where temp files are stored. The PC automatically creates and deletes temp files, so the user has very little interaction with them. Users who diligently close all files and applications before turning the computer off may not even know temp files exist.

If, however, the PC is turned off while an application remains open or an application is interrupted by a power failure or a dead-halt before it has been exited, the temp file isn't deleted and remains in the TEMP or root directory. While this would probably only cause a minor nuisance in most systems, it could conceivably clog up the hard drive or fill the root directory with old temp files. (The root directory, which can hold only 256 separate files, is the only directory limited by the number of files it can contain.)

Fortunately, even in a worst-case scenario, ridding a computer of temp files is a fairly easy process.

Users of DOS 4.0 to 6.0:

1. Close all applications and exit Windows completely.
2. At the C> prompt, type `cd dos`. Press ENTER. You should see a C:\DOS> prompt; type `dosshell`.
3. You'll see a listing of the files contained on your computer. Press ALT-V to open the View menu. Use the arrow keys to highlight the Single File List command. Press ENTER.
4. Press ALT-T to open the Tree menu. Highlight the Expand All command. Press ENTER.
5. Use the TAB and arrow keys to locate the TEMP directory in your WINDOWS, DOS, or root directory. In some computers, the temporary directory may be spelled "tmp" rather than "temp."
6. Highlight the TEMP directory. The temp files contained within it should be listed on the right side of the screen.

7. Use the TAB key to switch to the file listing. Highlight any file ending with a .tmp file extension or some derivative of that file extension, such as .-mp or .tm-. Press DELETE. A message verifying that you want to delete the file will appear. Make sure the cursor is in the Yes box. Press ENTER.
8. If you have a lot of temp files to delete, use SHIFT in conjunction with the arrow keys to highlight multiple files at once. Press DELETE. A message will verify that you want to delete all of the files. Make sure the cursor is in the OK box. Press ENTER. A second message will appear asking you to verify that you want to delete each file. Make sure the cursor is in the Yes box. Press ENTER.
9. After you have deleted all the temp files, use ALT-F to open the File menu. *Do not delete the TEMP directory!* Cursor down to the Exit button. Press ENTER. You will return to the DOS prompt. Type `cd..` to return to the C> prompt.

For users of other DOS versions:

1. Close all applications and exit Windows.
2. At the C> prompt, type `dir /p`. If you use the Windows operating system, you will find a WINDOWS directory among the list of files.
3. At the next prompt, type `cd windows` (or `cd [your Windows directory name]`). Press ENTER, then type `dir /p` at the C:\WINDOWS> prompt. Look for a TEMP directory in the WINDOWS directory.
4. Type `cd temp`, press ENTER, and type `dir /p`. If the TEMP directory has any temp files in it, they should appear on-screen.
5. Type `del [file name]` and press ENTER for each of the temp files found.
6. After deleting the temp files, type `cd..`, press ENTER, then type `cd..` again at the prompt. This returns you to the C> prompt.

Follow the above steps for deleting temp files in your DOS TEMP directory, replacing the word **windows** with the word **dos**. If you can't find a TEMP or TMP directory in either the WINDOWS or DOS directory, look in your root directory for temp files. At the C> prompt, type `dir /p`. Delete any temp files found. You can safely delete temp files because the data contained within them has already been saved to another location.

For Windows 95 users:

You can delete temp files using Win95's My Computer. This won't get rid of all your temp files—the temp files that are in use by Windows can't be deleted—but it's the best you can do in Win95.

If you don't have a TEMP directory in your WINDOWS or DOS directory, you can choose to create one to catch your temp files:

1. At the DOS prompt, type `edit autoexec.bat`.
2. In the Autoexec.bat file, add the line `set temp=c:\temp` to the bottom of the command list.
3. Directly below this line, type `md c:\temp`. This will create a temporary directory that will gather all temp files. You don't need to add this command if you already have a TEMP directory in your WINDOWS or DOS directory. ●

by Jeff Dodd

Basic Training

Regardless of the operating system you choose, there are a few elementary functions you should understand. This monthly section is your one-stop guide to learning these crucial first steps in DOS, OS/2 Warp, Windows 3.1, and Windows 95. Use it to learn your operating system and see whether others offer a smarter way to work.

INSTALLING A PRINTER



Printing is one of the most basic computing functions. After all, even if you can send your documents to other users electronically, odds are that you need to be able to print them. Before you can print anything, though, you must install your printer. For this article, we used a Hewlett-Packard DeskJet 682C. The installation steps for this printer may vary from those for yours; if this is the case, follow the instructions that came with your printer.

The first step is the same for all four operating systems: start your system with the printer already connected and turned on.

MS-DOS 6.22

To install a printer in DOS, insert the appropriate diskette from those included with the printer (in this case, it was the third diskette of four; read your printer manual to be sure), type `a:\install`, and press ENTER. This opens the setup program. Read the license agreement and the explanation of the installation, pressing ENTER after each to continue. A window will open with lists of printers and ports. The correct printer and port should be highlighted; if not, highlight them. Then press ENTER again to continue.

Next, you'll be prompted to choose Check to check the communications between the printer and your computer. You'll get a message letting you know that communication has been established. Press ENTER to continue. Several screens of explanation about the printer installation will appear; press ENTER after each.

After this explanation, you'll be told that you need to **reboot** (restart your computer) and then perform printer cartridge alignment. Press ENTER to reboot your system. At the DOS prompt, type `djcp` to open the DeskJet Control Panel. When the Control Panel opens, press **A** to choose Align Print Cartridges. Read the explanation and press **A** again to choose Align. A window with two alignment patterns will open, and the same patterns will print. Select the button under the best-aligned pattern in each set (those that have the straightest lines on the paper) and choose OK. A test pattern then will print; its lines should be straight. If they are, choose Done. If not, choose Align Again to restart the process. When you've finished the

process, you'll be back at the main screen of the Control Panel. Choose Done to exit.

OS/2 Warp Connect

To install a printer in OS/2, open the Templates folder and use the right mouse button to drag the Printer template to the desktop. Enter your printer's name in the Name field and left-click the port to which your printer is connected. If you're installing a new driver, left-click Install New Printer Driver. If the driver you need is on the list of drivers included with OS/2, left-click it. If not, left-click Other OS/2 Printer Driver. (Either option probably will require you to insert the diskette or CD-ROM with the driver on it. If you choose Other OS/2 Printer Driver, you'll have to specify the directory in which OS/2 can find the driver. OS/2 then will create a list of the drivers it found; choose the one you want.) When you've selected the driver you want, left-click Install.

OS/2 will let you know when the driver has been installed correctly. You'll then be prompted to left-click OK to return to the Create A Printer window. Next, left-click Create, and the installation will be completed.

OS/2 didn't perform the cartridge alignment procedure included in the DOS and Windows setups. However, when we printed a test page, it printed correctly, so the testing appears to be unnecessary.

Windows 3.1

To install a printer on a computer with Windows 3.1, insert the first printer installation diskette, type `a:\setup` at the prompt, and press ENTER. This starts the setup program. The License Agreement appears; read it and click Agree To The License. Setup will tell you what printer it found and what port the printer's using. Check the information and click OK if it's correct. (If either detail is incorrect, correct it on the drop-down list and click OK.) Setup then installs the necessary printer driver; you'll be asked to switch diskettes periodically. Setup will ask whether you want to install the fonts on your hard drive. Click either Install Fonts or Don't Install Fonts. (The advantage of installing the fonts on your hard drive is that they're there for you to use whenever you need them; the disadvantage is that they take up considerable space on your hard drive.)

When Setup is completed, it explains what changes have been made; read this information and click OK. Setup then explains cartridge alignment and prompts you to click Restart Windows. When Windows restarts, the HP 680C Toolbox icon appears on the desktop; double-click it. When the Toolbox window opens, click the Printer Services tab, then click Align Print Cartridges. The alignment process is the same as that in DOS.

■ Windows 95

The New Hardware Found window should appear after Windows 95 starts to let you know that Win95 found your printer. Then a second New Hardware Found window opens, asking which driver you want to install. Your choices are Windows Default Driver, Driver From Disk Provided By Hardware Manufacturer, and Do Not Install A Driver. Choose the second option and left-click OK. This will open the Install From Disk dialog box; insert the first diskette and left-click OK. The Add Printer Wizard opens, displaying the printer name; left-click Finish. The files will copy to your hard drive, and you'll be prompted to agree to the licensing agreement. HP Printer Setup then checks the communications between the printer and the computer and prompts you to choose whether to install the fonts. If you want the fonts on your hard drive, left-click Install Fonts and change diskettes as prompted. Setup then will explain the changes it made; left-click OK when you've read the information. The last step is to align the cartridges; the process is the same as for DOS.

PRINTING

Now that your printer's hooked up, you're ready to learn how to print files.



■ MS-DOS 6.22

The simplest way to print a file in DOS is to use the PRINT command. (However, this command is meant for printing DOS text files, not files created in applications such as *Microsoft Word*. To print those files, use the Print command in the application.)

To use the PRINT command, type `print [path]` at the prompt, replacing [path] with the path and file name of the file you want to print, and press ENTER. For example, to print a file named `Myfile.txt` in the `C:\` directory, you would type `print c:\myfile.txt` and press ENTER. (You may be prompted to enter the device name of your printer, such as `LPT1`.)

Another option is to print a file from the DOS Editor. (This option only works with printers with the device name `PRN` or `LPT1`. If your printer has another device name, such as `LPT2` or `COM1`, you'll need to use the PRINT command as described above.) To start the DOS Editor, type `edit` and press ENTER. Press ALT to activate the menu bar. Select Open from the File menu, press ENTER, type the name of the file you want to print in the File Name line, and then select OK.

Once the file is in the editing window, you can print all or part of it. To print only part of the file, move the cursor to the beginning of the part you want to print. Highlight one line at a time by pressing SHIFT and the Down arrow. When you've highlighted the text you want to print (or didn't highlight any text because you want to print the whole file), activate the menu bar again by pressing ALT, select Print from the File menu, and press ENTER. The Print dialog box opens; choose between Selected Text Only and Complete Document, then press ENTER to begin printing.

■ OS/2 Warp Connect

There are several ways to print in OS/2. The easiest is to use the right mouse button to drag the icon for a text file to the Printer icon. (You may need to specify whether the file is plain text or printer-specific data.) You also can select a data file icon, right-click it to get the pop-up menu, and select Print from the menu.

Another method is to use the PRINT command at a command prompt. Start either an OS/2 or a DOS session, type `print [path]`, and press ENTER, just as with DOS.

■ Windows 3.1

In Windows 3.1, documents are usually printed by choosing Print from the File menu in the application in which you created the document. (You also can click the Print icon on the application's toolbar.)

To print a file from File Manager, click the icon for the drive on which the file is found, then click the file itself to select it as the one you want to print. Then choose Print from the File menu. The Print dialog box will open; change any settings if necessary and click OK to begin printing.

You also can print a file in either Notepad or Write. Choose Open from the File menu, then choose Print from the File menu.

■ Windows 95

Win95 documents can be printed the same way as in Windows 3.1. The most common option is printing from within the application that created the document. There are other options, though. You can go into either My Computer or Windows Explorer and drag the file you want to print to the Printer icon. You also can print a file by opening it in either Notepad or WordPad and choosing Print from the File menu.

Win95 also offers another option. You can right-click the file you want to print, point to Send To on the pop-up menu, and left-click the printer. (Before you can do this, you need to add your printer to the list of Send To destinations. To do this, go into the Send To folder, which is a subfolder of your Windows folder. Create a shortcut in the Send To folder that leads to the printer.) ●

by Diana K. McLean

Keeping Track

Relational Databases Organize Complex Information

If the basic purpose of a computer is to store and analyze data, the basic application to do it is the database.

Everything from baseball card collections to complex business systems relies on databases to keep track of the loose ends and provide an easy way to access crucial records at any time. Today's databases are flexible and powerful, giving both home and small business users the tools to manipulate and remember records in whatever way they need.

Though they all have similar functions at their foundations, not all databases perform the same way. Being one of the first computer applications, databases have had a chance to mature into specific niches. If you're looking for a database, the first decision to make is whether you need simple flat-file or more complex relational capabilities.

■ Flat vs. Relational

A standard, or flat-file, database is best envisioned as a grid or table. We could use a flat-file database to make a list of books in our book collection. The titles of the books might be lined up in the first column of the table. In other columns, we could note the author, publication date, and other information.

Flat-file databases are easy to understand, and it doesn't take long for someone to get the hang of using one. A common example is the database found in *Microsoft Works*, a popular word processing/spreadsheet/database application that comes bundled with many new computers. Works' database component can sort information, search through the data for a specific string of characters, work in

conjunction with the word processor to create a mail merge, and perform other nifty tasks. The thing it cannot do, however, is work with other databases. That's where relational programs come in.

With a relational database, the same information can exist in two or more files simultaneously. When records are changed in one part of the database, that information is changed wherever it exists in other tables of the database. This increases accuracy while eliminating the duplication of data that can occur in larger systems.

Relational databases are probably easiest to understand by constructing a simple example. Let's say we run a video rental store. We need a system that keeps track of our inventory, customer information, and invoices we generate when customers rent videos.

With a relational database application, we could set up three tables: one for customers, their addresses, and phone numbers; one for our video inventory, their replacement schedules, and other information; and one to keep track of the invoices we generate in day-to-day operation (see graphic on next page).

The Invoice Table would combine elements of both the Customers table and the Video table. As you can see in the graphic, a new invoice is generated whenever a customer rents a video. The customer hands us an ID card, and we enter the number into our computer. The Invoice form we see pulls up the customer's name, address, and phone number automatically. This is because we have set up the name and address fields in both the customer and invoice tables as relations. Not only does this save us having to type in the name and address again, but if the information changes in one table, it is immediately updated in both tables. If a customer moves, his address changes in the Customer table and all invoices concerning him in the Invoice table. Even if we look up an old invoice because of a late return, we'll see the current address.

Now that we have the customer information, we'll add the video information. We track videos by numbers. When we type in



the number off the video box, the name and rental price of the video pop up in the invoice. Rather than using relations to link the Invoice table to the Video table, however, this time we will set the invoice form to perform a lookup, which copies information to only one place rather than the entire table. This way, if we change the price tomorrow in the Video table, the price won't change automatically in the invoice table; only present and future rentals are affected. Our customers would be understandably upset if we changed all their rental prices retroactively.

These two techniques—relations and lookups—are the heart of relational databases. Together, they can define a complex web of databases all working together to keep track of whatever information we deal with.

The powerful relational databases built for today's computers include a host of other features for manipulating data. Most include some type of programming or macro language that lets users define complex relationships between records. Macros can be linked to graphical, on-screen buttons that perform a task when clicked by the mouse. Using such a database, advanced users can build entire applications and distribute them to others.

Advanced databases also know how to work with a computer's other applications using DDE (Dynamic Data Exchange). This lets users do things such as click a button next to a name in their "address database" to open a pre-addressed message form in their E-mail program. Users can launch other applications, create scripts in programming languages such as BASIC or C, and launch them with a command from the database. As with the flat-file databases, relational databases are also great tools for merging addresses with form letters in word processing programs.

Using a relational database involves moving between two main modes. Most frequently used is the **browse mode**, in which the information can be looked at and analyzed. In the design

mode, the user can determine how the information is presented.

To understand the distinction, we'll deconstruct a relational database. At the heart of the database is the table. Tables contain data in the same grid format we're used to from flat-file databases. However, the user is usually separated from this rather boring list by the **form**. Forms represent different views of the data. Fields containing records can be arranged in different ways; for example, text labels can be added and pictures can be used to spice things up. In browse mode, users hop from form to form by pushing buttons or using other commands. Forms also can be used to input data as well as display it.

Besides input and display forms, there are also report forms. Reports are mainly lists of information filtered and presented in a useful way. For example, in a database of phone contacts, one report form might be designed to list first names, last names, and phone numbers only, excluding information such as street addresses.

All of these forms are built in design mode. Designing a form is something like programming a new application. It sounds difficult, but the latest databases include a bevy of step-by-step helpers to lead you through the quagmire.

It isn't a cakewalk by any stretch of the imagination, but patient users armed with the instruction manual can set up the forms they need. The best programs don't even require typing in macro codes but rely on a point-and-click system for defining actions.

■ Product Roundup

We designed our own simple forms and reports using four relational databases to get an idea of what they can do and how easy it is for a newcomer to get started. All are current releases designed to work with Windows 95, but each comes from a long line of previous versions that will run in Windows 3.x.

Microsoft Access 7.0. This is the latest version of the software giant's relational database. It comes as part of *Microsoft Office Professional Edition* or can be bought alone for \$299. Perhaps the biggest advantage to Access is its integration with the rest of Microsoft's Office Suite programs, such as *Excel* and *Word*. For instance, small business users who may be using the Excel spreadsheet as a "database" but want to move to relational capability can simply drop an Excel file directly into Access.

Another interesting little feature is **Filter By Selection**, which eliminates the need to

Inside A Relational Database

RELATION information exists in two places

FORM 1 - Invoice

Video Store Inc.

INVOICE # 1001
Date 1/1/96
CUSTOMER ID 634

Customer:
Joe Smith
555 Main
Anywhere, USA 55555

#	Category	Description	Price
528	Movie	Star Wars	\$1.50
894	Movie	Empire Strikes Back	\$1.50
126	Movie	Jaws 3-D	\$2.00

Total \$5.00

LOOKUP information is copied from one location to another

FORM 2 - Customers

Customer ID: 634

Name: Joe Smith
Address: 555 Main
Anywhere, USA 55555
Phone: 555-5555

FORM 3 - Movies

Movie ID: 528

Title/Description: Star Wars
Date Acquired: 5/2/90
Rental Price: \$1.50
Rental Charge: \$1.50

The invoice is linked, or related, to the customer info in Form 2. Whenever information changes in the Customers table it changes in every entry dealing with that customer in the Invoice table. That way the data is always current. The invoice form merely "looks up" or copies information from the Movies form to get the latest price. If the price changes, it doesn't affect movies already entered.

run full queries for simple questions. If users are looking at a database of customers in different countries and want to see all customers in Italy, they could simply highlight the word Italy in one of the customer's records and left-click the Filter button. Access then automatically locates all records with Italy in the country field. You also could select part of the word and search for all countries beginning with the letter I.

At first, Access seems imposing to the new user. However, its many Wizards help guide beginners through the basics of databases. Microsoft's Answer Wizards, available in all MS Office applications, let users type questions in English and get help—at least most of the time.

One thing we disliked about Access was how it dominated system resources whenever we ran it. Access is a memory hog, but it is a powerful hog. For users of Microsoft Office, it seems the natural choice.

Paradox 7.0. One of the most full-featured, mature databases around is Borland's *Paradox 7.0* for Win95, NT, 3.1, and Windows for Workgroups. Borland says Paradox integrates with both Microsoft Office 95 and Novell's *PerfectOffice 7*. Act-alike menus let users of both systems use the skills they learned in those programs.

For new users, Paradox includes a new Quick Start Expert that gives beginners a menu to get them started. It can lead to the Database Expert, which automatically creates one of several predetermined databases. Other Experts help users create mail merges with the help of word processors, create tables, make charts, and import data from other applications.

More advanced Paradox users can generate new forms and buttons with a minimum of coding thanks to the New Button Expert. Common tasks, such as printing reports or inserting records, can be attached to buttons through pointing and clicking. Paradox also includes a developers' programming language called ObjectPAL.

Borland recommends 12 megabytes (MB) of memory for Win95 installations, but our 24MB machine found it hard to run much else once Paradox got going. It seems most databases are tough on resources. We found Paradox 7 for \$284.

Lotus Approach 96. Built by the company famed for Lotus 1-2-3, *Lotus Approach 96* offers tight integration with that program as well as *Lotus Notes*. The menu structures, dialog buttons, and other features look similar to those in

other Lotus applications. Approach can read database files in a variety of formats, including dBASE, Paradox, and others.

Being built for a networking environment, Approach also includes a variety of security features that let users control access rights. *TeamMail* lets users send Approach information through their E-mail systems using sophisticated routing commands and tracking.

Macros are easy to write in Approach. Users can simply choose a command from a list in the Define Macro screen, then select options for the command from given choices. This means you don't have to remember obscure commands. For more advanced users, Approach includes *LotusScript*, a full programming language.

Approach uses a notepad interface that reduces confusion for beginners. Helpers called Approach Assistants offer guides to creating some of the more common reports and forms. *SmartMaster Applications* are helpers similar to Microsoft's Wizards for building new databases by left-clicking options.

We found Approach to be somewhat easier for the new user to understand than, say, Microsoft Access. For environments where other Lotus products are used, Approach is a good bet. Even those who don't use the Lotus office suite might want to take a look at this \$100 application.

FileMaker Pro 3.0. Claris Corp. claims *FileMaker* is one of the few databases typically installed and used by the same person. It is designed for the newcomer, and it shows.

FileMaker Pro features the easiest way to write macro scripts that we have seen. The interface includes a list of all available commands. Users simply left-click the mouse to insert a line into the code. Various options for each line can be changed by left-clicking other buttons. For the non-programmer, this greatly eases the task of setting up a more complex database. Along with having all of the available commands in front of you, no typing means no syntax errors that can be difficult to find.

FileMaker includes a few other extras. It's able to perform a mail merge without a separate word processing program. The program supports the IPX/SPX and TCP/IP protocols that are used on most networks for sharing files among several users right out of the box, which is a good value for small businesses. For better performance on large networks, a *FileMaker Pro Server* is available.

At about \$199, *FileMaker Pro* is by far the easiest professional relational database for

someone new to the genre. *FileMaker's* point-and-click programming is especially easy to pick up when you are starting out with database design.

■ Touching Base

This quick glance at some of the leading relational databases isn't meant to be a comprehensive guide. All of these programs have advantages and disadvantages that could be more or less important according to what you need them to do.

In these days of booming office suites, the best way to select a relational database is to look at the programs you're already using. If you own Microsoft Word and Excel, Access is probably the best bet. An office structured around Lotus Notes would do well to consider Approach 96. For those who aren't married to a certain office suite, we recommend an extra look at *FileMaker Pro* on the strength of its remarkable ease of use.

Whichever database you might choose, the important thing to remember is that no one becomes a relational database expert right away. These are complicated programs to learn, but the investment in time is worth it. Once everything is set up and the unorganized seas of information have been tamed, a well-constructed database can greatly simplify daily office operations. ●

by Alan Phelps

For More Information:

FileMaker Pro 3.0

Claris Corp.

(800) 544-8554, (408) 727-8227

<http://www.claris.com>

Lotus Approach 96

Lotus

(800) 343-5414, (617) 577-8500

<http://www.lotus.com>

Microsoft Access 7.0

Microsoft

(800) 426-9400, (206) 882-8080

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Paradox 7.0

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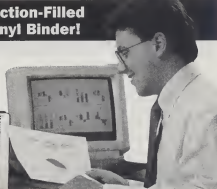
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The Latest Color Inkjets Make A Splash

Color printing capabilities have become a necessity for many professional and novice desktop publishers. Whether it's a birthday card for Dad or a small company's quarterly newsletter, computer users realize that color can make the difference between a good project and a great one.

While small-time publishers may have huge ideas as to what they could do with a color printer, most do not have huge sums of money to buy that printer. While desktop color laser printers are starting to reach a larger market, most still cost more than \$5,000. (See the sidebar "The Laser Option.") That is a price well out of reach for the average computer user. With color laser printers more of a dream

than a reality, many people have turned to color inkjets.

Those people have found a market loaded with a wide range of products and plenty of options, as well as prices more to their liking. Starting in the \$200 range and topping out around \$2,500, inkjet printers offer computer users the benefits of color without the high purchase price often associated with it.

■ In The Beginning

PC users have embraced the inkjet printer market relatively recently, with sales increasing dramatically in the last few years. But it wasn't always that way.

Early inkjet printers seemed to have almost as many bad qualities as good ones. While they offered better printing than dot matrix printers, they were plagued by a number of problems. The largest of those problems included huge variations in print quality, a tendency to bleed ink on the page when used for graphics, and a nasty habit of creating print that smeared at the slightest touch. Early inkjet printer owners were undoubtedly an irritable and inky bunch.

But inkjet printer manufacturers apparently saw some potential, and they kept working at the process. Over the years, they made steady progress. They improved the technology used to apply the ink, and they created new and better inks that wouldn't bleed or smear as easily. They also helped develop new types of paper, geared toward minimizing the shortfalls of the average inkjet printer. Finally, they developed methods for adding color to the mix.

■ But How Does It Work?

While each manufacturer's inkjet printer works a little differently from the others, they all operate using the same basic principles. The process starts when the computer sends the printer a series of commands. The printer translates those commands into instructions it can use, then transmits those instructions to the print head.



The print head is a device with hundreds of tiny little nozzles, each filled with drops of ink that flow from removable ink cartridges. In a color inkjet printer, the print head has nozzles filled with four colors of ink: cyan, magenta, yellow, and black. A color-capable inkjet printer has only the cyan, magenta, and yellow; it makes black out of a combination of the other three.

Once the print head has its instructions, a roller moves a piece of paper into the printer and into line with the print head. The print head moves across the width of the paper, forcing ink through the nozzles with great speed and accuracy. The ink lands on the paper and creates tiny dots arranged in a precise pattern. The smaller the dots in that pattern, the more precise the image. Printer image quality is often described by citing the number of dots per inch (dpi) the printer can produce.

When the print head reaches one edge of the paper, the roller moves the paper forward a notch, and the print head makes another pass. The print head repeats this step until it has covered the entire page. Then the paper rolls out into a waiting tray, and the process is complete.

While this explanation oversimplifies the process a bit, inkjet printing isn't all that complicated compared to other high-quality printing technologies. And that is one of the biggest advantages inkjet printers have going for them, according to Paula Bursley, a printer industry analyst at the market research firm Dataguest.

"The technology here isn't nearly as complex as a color laser printer," she says.

Less complex technology means color inkjet printers are easier to use and maintain, Bursley says. There are fewer opportunities for breakdowns and not as many parts to wear out. It also means inkjet printers are much cheaper to build, which helps keep the initial purchase price so much lower than color laser printers.

■ It's Not All Good News

Despite all the strides inkjet printers have made in recent years, they still have some drawbacks potential buyers should understand.

The first is that almost without exception, inkjet printers cost more money to operate in the long run than laser printers. That has to do with the ink cartridges. They can be expensive, and depending upon how much color you print, you can run through them relatively quickly. Essentially, it will cost you at least a

And finally, while refinements in inkjet technology have made it possible for these new printers to create exceptionally high-quality images, most cannot attain the image quality of a laser printer. If a computer user's job includes working with photographic images or highly detailed color reproductions, a laser printer might be the best option.

Now that you understand some of the pros and cons of inkjet printers, we can examine some of the products that are available on the market.

■ Product Reviews

For this review, we looked at color inkjet printers from the low-to-middle price range on up to the high end. All of the printers we reviewed worked well. They all came from major manufacturers and seemed to be well-made, quality products. We had no significant

problems installing any of these printers on our 90 megahertz (MHz) Pentium Dell Dimension running Windows 95. The software and documentation included with each of the printers was clear and concise, and we never needed to call technical support.

We used each of the review units to print a series of different projects, ranging from a Microsoft Word document to a CD-ROM photo image to a desktop publishing project created in Microsoft Publisher. We ran our test documents in draft and high-quality modes, and we used each printer's software to select automatic and manual image settings.

We soon found that image quality, apart from some color variations, was relatively consistent among the machines we tested. While there was a difference between images printed at the different dpi settings, finding those differences without the aid of a magnifying glass was at times nearly impossible. We figured if you have to look that hard, who cares?

We also came to the conclusion that with only a few exceptions, most of the machines printed at roughly the same speeds. Sending a draft version of a Word document through usually only took a few seconds; sending full-color photographic images through on a high-quality setting meant we had anywhere from four to seven minutes to sit and reflect on life. Full-color, heavy-coverage inkjet printing is not a particularly fast process.



The DeskJet 1600CM is one of Hewlett-Packard's top color inkjet printers. It is capable of printing at 600 x 600dpi.

few pennies more per page to print the exact same document on an inkjet printer instead of a laser printer.

A few extra pennies a page might not seem like much, especially if it means saving thousands of dollars on the initial purchase price. The cost difference per page probably won't add up to much for a student or home PC user who only prints a few hundred sheets of paper a year. But for a busy small office that prints thousands of pages a year, the costs can add up fast. Some hard-core printer users may find it just as cost-effective to spend the extra money up front for a laser printer.

Another problem with inkjet printers is that while there have been significant improvements in ink formulas and paper content, even the best inkjet documents are still extremely susceptible to water damage. While few printed pages from any printer are immune to the effects of water, inkjet-printed pages are especially vulnerable. One wet inkjet page can lead to bleeding ink that ruins hundreds more. It also can do a real number on a white dress shirt.

And according to Bursley, even if an inkjet-printed document does stay dry, it simply can not retain its image quality over time the way a laser-printed document can.

"An inkjet document can probably hold its image quality for about one year," Bursley says. After that, it starts to fade and deteriorate quickly.

That said, let's take a look at our review units. As you examine the specifics, keep in mind that the characters per second (cps) or pages per minute (ppm) listings reflect the manufacturers' best-case scenarios.

Canon BJC-4100

Estimated street price: \$266.

Maximum dpi setting: 720 x 360.

Speed: 300cps on high-speed setting;

205cps on high-quality setting;

0.7-1.3ppm for color.

Warranty: two years.

The 4100 was the lowest-priced printer in our review. But a low purchase price doesn't mean low print quality, or a shortage of cool extras, on this drop-feed, desk-space-friendly machine.

This printer does an excellent job of producing the full range of images we threw at it, using its maximum dpi of 720 x 360 and Canon's "automatic edge smoothing technology" to create some very sharp images.

One of the 4100's best qualities is its software, called *Color Advisor*. In addition to a wide range of options that make sending an image as easy or as advanced a task as you want it to be, the program also includes a handy little tool that lets users add color to plain black-and-white documents and enhance the colors of other documents.

Other extras include the *Canon Creative CD-ROM* with software and supplies for creating everything from birthday cards to magnets to T-shirt transfers and the *Canon Visual Guide* software, which makes learning more about the printer easy.

Quality printing, a nice software package, and a palatable price tag make the 4100 a great investment for the home user.

Hewlett-Packard DeskJet 682C

Estimated street price: \$329.

Maximum dpi setting: 600 x 600 (black),

300 x 600 (color).

Speed: 5ppm black draft (EconoFast); 1ppm

in best mode; 0.3ppm color in best mode.

Warranty: one year.

As one of the newest and most affordable releases from the industry's biggest player, the 682C has a lot of expectations to live up to. It does so admirably with quality printing and a specialty software package that lets you print everything from banners to

invitations featuring everybody's favorite rodent: Mickey Mouse.

The first thing we noticed about this printer was its exceptional user-friendliness. Just as we were getting started, it politely pointed out to us that we had incorrectly installed the black ink cartridge. Once we corrected the cartridge error, it walked us through the cartridge alignment process.

The software package for the 682C is simple to use; our test documents came out looking sharp and full of color.

The biggest drawback to this machine, and to all of HP's printers, is that their spread-out design demands a great deal of desk space. But what's another half-foot of desktop when you gain quality printouts, good software, and a decent price?

Lexmark Color Jetprinter 2070

Estimated street price: \$399.

Maximum dpi setting: 600 x 600.

Speed: 7ppm black in draft mode; 5ppm

black high-quality mode; 1ppm color.

Warranty: two years.

The best feature on the 2070 is its software. The *Color Fine 2* software's control panel offers a wide range of printing options. For instance, a computer user can choose from four different print speed/

quality settings: draft, normal, high, or presentation. The software also offers automatic and manual image settings, a self-timer, and a handy cartridge alignment utility. The software even shows how much ink remains in the black and color ink cartridges. Lexmark also throws in a copy of *CorelDRAW!* to give the user a strong graphics program with which to work.

Unfortunately, the software really was the best feature on the 2070. The print quality of this slim, upright machine was acceptable but rarely exceptional. In some instances, the 2070's output seemed a little less crisp than its competition.

The 2070 is a decent printer with a truly top-of-the-line software package.

Epson Stylus Pro XL

Estimated street price: \$1,799.

Maximum dpi setting: 720 x 720.

Speed: text at 200cps.

Warranty: two years.

As the XL in the name implies, this is one extra-large printer. One of the Pro XL's most obvious features is its ability to handle a variety of paper sizes, all the way up to 13 inch x 19 inch. This kind of capacity makes it a good option for computer users who work on a larger scale than the rest of us.

The laser option

Today's inkjet printers can produce high print quality. But when you come right down to it, they still can't beat the average color laser printer, the machine that sets the standard by which people judge even the best inkjet printers.

Of course, being the best means having a price tag to match, and, unfortunately, color laser printers have always been too expensive for the average computer user, or even small businesses, to afford.

But that's starting to change. In the last few years, prices on some of the major manufacturers' color laser printers have dropped from more than \$10,000 into the \$6,000 range. That is still far from cheap, but for some, it's a difference that makes color laser printers worth a look.

Todd Birzer, a program manager for Hewlett-Packard's Color LaserJet printers, says one of the reasons prices are coming down is because of improvements in the technology used to make the machines. As his company has worked to improve its line of laser printers, it has found ways to simplify and refine the designs, making the printers better and less expensive.

One of the ways HP refined and improved its latest series of color laser printers, the Color LaserJet 5 and 5M printers, was to implement what Birzer called "direct to drum" technology. To understand this technology, you first have to understand how a color laser printer works.

First, the computer sends an image or document to the printer. The printer breaks down the information into pieces it can use, including

Of course, just being able to handle big sheets of paper doesn't make the Pro XL all that special. It's the printer's high-quality 720 x 720dpi printing capabilities that do that. Despite our declaration earlier that a higher dpi doesn't always produce a visible difference in print quality, the Pro XL created some of the best images we viewed. The photo images were especially crisp.

The Pro XL is obviously a more professionally oriented printer because Epson didn't include any fun software extras like those in the BJC-4100 and the HP 682C. But we did enjoy the regular software package, which lets users be as specific as they want to be when choosing image settings.

If there is one drawback to the XL, apart from the fact that it is about as big as a sub-compact car, it is the speed. Even taking the 720dpi into consideration, this printer seems to take an exceptionally long time to produce.

But with the extra-big paper handling capacity and fine printing quality, we found our documents were usually worth the wait.

Hewlett-Packard DeskJet 1600CM

Estimated street price: \$2,269.

Maximum dpi setting 600 x 600.

Speed: 9ppm black draft (EconoFast); 8ppm black in presentation mode; 1ppm color in presentation mode.

Warranty: one year.

The 1600CM was the most expensive printer in our review, and it performed like it. A network-capable printer that can pump out pages at an exceptionally fast rate, the 1600CM produced the highest-quality images we saw.

While the 1600CM has only 600 x 600dpi, it makes the most of each of those dots, using HP's Resolution Enhancement technology and ColorSmart software to create clean, clear images every time.

A true office-type printer, the 1600CM prints all-black pages in a flash, with color not far behind. And not only do the pages fly through the printer, they do it so quietly that a busy office worker might not even hear the printer at work.

In addition to its high print speed and quality, we liked the 1600CM's individual color inkjet cartridges. Instead of the three colors sharing one cartridge, each color has its own cartridge in the 1600CM, which seems pretty economical. When you run out of a color in a single-cartridge machine, you have to replace the whole cartridge, even if the other two color chambers still have ink left in them. With the 1600CM, you can wait to replace each cartridge until it is totally empty.

A printer for the true professional, the 1600CM carries a steep price tag and the quality to make it worth the money. ●

by Tom Mainelli

For More Information:

BJC-4100

Canon

(800) 848-4123

(714) 438-3000

<http://www.canon.com>

DeskJet 682C, DeskJet 1600CM,
and Color LaserJet 5M

Hewlett-Packard

(800) 752-0900

(208) 323-2551

<http://www.hp.com>

Jetprinter 2070

Lexmark

(800) 358-5835

(606) 232-2000

<http://www.lexmark.com>

Stylus Pro XL

Epson

(800) 463-7766

(310) 782-0770

<http://www.epson.com>

the precise amounts of yellow, cyan, magenta, and black coloring it will need to accurately reproduce the image.

Then the printer uses a laser to draw the image on a negatively charged photoconductive drum. The area touched by the laser loses some of its charge. The drum then rotates past an area that contains four different colors of toner. (Toner is a colored powdery substance with an attraction to the low-charged areas on the drum.) When the drum rotates past the correct toner color, the toner "jumps the gap" onto the drum and precisely re-creates the image.

In the new 5 and 5M Color LaserJet Printers from HP, the printer repeats the process using all four toner colors, laying one toner down on top of the next to assemble the entire four-color image on the drum. According to Birzer,

most printers only handle one toner color at a time, transferring the image to another drum or directly to the paper before adding another color. HP's method allows for greater precision and color blending, not to mention the cool "direct to drum" catchphrase.

Once all four toner colors are on the drum, a piece of paper moves up and around and over the drum. The drum places the toner image onto the page, and the paper passes through a fuser (which is very hot), melting the toner onto the page. The paper then exits the printer.

After our talk with Birzer, we had an opportunity to review the Color LaserJet 5M. The printer impressed us, to say the least. After weeks of staring at inkjet images, no matter how high the quality, we had to admit that the 5M easily bested them all.

Of course, with a price tag of about \$7,400, this network-compatible, 36MB of RAM, 30,000-page-a-month monster should do a better job than a \$500 inkjet printer. The 5M's little brother, the Color LaserJet 5, costs about \$5,995.

The 5M did such a good job, in fact, it pointed out the distinct limitations of the 256-color video card and monitor we were using with our computer. How embarrassing.

Using the color laser printer for a few days served to illustrate a point we made earlier. Color inkjets are great, especially for individuals or companies that simply cannot afford a laser printer. But for the company who can afford the up-front cost, the laser way is still the best way. ●

3-D

Comes To Our Senses

3-D has been touted as the "next step" in entertainment ever since the first funny paper glasses were handed out at movie theaters.

Today's three-dimensional (3-D) computing isn't quite the same as seeing "Jaws" in 3-D at the Cinema 8. No monsters pop out of the screen. No one ducks in their seat with terror. In fact, no matter how 3-D a computer claims to be, everything it displays is still trapped on a flat-screened monitor. That seeming contradiction leads to perhaps the biggest question in 3-D computing: What is it, anyway?

In the world of computers, 3-D usually means the *appearance* of depth, not actual depth. The line between a two-dimensional (2-D) and 3-D scene can be fine. Many computer game players remember *Doom*, the anarchic shoot-'em-apart where participants walk through a series of rooms and corridors. The graphics in that game helped create the illusion of three dimensions, but the creatures and objects were actually flat and two-dimensional. Monsters' appearances did not gradually change as the player moved around them because there were only a certain number of views available.

Contrast that with a game such as today's *Descent II*, in which players can fly and see enemy robots from every angle. That is what computer folks mean by 3-D—being able to move around images and see them from



whatever angle as the computer continuously redraws the screen.

The 3-D term also applies to sound. Basic 2-D stereo sound seems to come from two speakers. The sound can seem to come from a point between the speakers or from one speaker or another. True 3-D sound, on the other hand, seems to come from every direction, even to the sides or behind the listener, regardless of the fact that there aren't any speakers back there.

All of this 3-D, especially in the realm of video, takes a lot of computing power. Not until the arrival of machines with Pentium CPUs and megaloads of random-access memory (RAM) could 3-D really work well on a home system. The 32-bit Windows 95 also helps 3-D in two important ways. Not only does it provide a more advanced operating system for 3-D applications to run on, but it also eliminates lower-powered PCs from the game. If you have a computer too slow to decently run Win95, you might as well hang up any 3-D dreams.

If you're ready to enter the land of 3-D computing, get set for a good ride. Some users compare the gradual shift from 2-D to 3-D to the change from text-based displays to

graphical user interface (GUI) displays: 3-D will foster a new category of applications that let users walk through fluid, photorealistic 3-D environments on home PCs.

Picture This

In the world of 3-D graphics, the most extreme sort of 3-D requires special goggles. These stereoscopic "virtual reality" displays typically cost hundreds of dollars and only work with a few games optimized to take advantage of their capabilities. Forte Technologies' VFX1 HeadGear, Virtual i-O's Virtual i-glasses, and VictorMaxx Technologies' CyberMaxx 2.0 are a few examples of the breed. All offer advanced 3-D graphics, but few people want to make the fashion statement of wearing a headset while using their computers. Such products fill advanced gamer yens, but they probably aren't heading for the mainstream anytime soon.

Most computer users are content with 3-D video cards that work with their existing monitors. 3-D cards make advanced graphics possible by moving what were until now software duties to specialized hardware, dramatically speeding up operations. That's important because redrawing every object from every

angle as the point of view moves through a scene places a huge demand on computer resources. A Pentium CPU equipped with the right 3-D software could run a 3-D display on its own, but it would take so many calculations that even today's fast 133MHz processors would get bogged down. At least in the foreseeable future, 3-D graphics will rely on CPUs and dedicated graphics accelerator hardware working in tandem.

Historically, the biggest problem with adding 3-D video hardware is that there has been no one standard. Software titles that provided excellent graphics under one card didn't necessarily perform under others. Software developers are forced to make different versions of their software to work with the different 3-D boards being sold by companies such as Diamond Multimedia, Creative Labs, and others.

This problem should finally be solved with the arrival of Microsoft's Direct3D. Direct3D is a new software interface that lets any 3-D program work with any 3-D chip. It gives developers a standard to use when they write 3-D into games and other programs. Microsoft says Direct 3D will be introduced by year's end, none too soon for anxious developers. Todd Reddick, product marketing manager for Diamond Multimedia, says a few Direct3D-enabled games might be out by this Christmas, but most software companies won't catch up until 1997.

Even when Direct3D takes hold of the market, it won't mean the end of chip-specific ports for games. Reddick says next year's games will likely be able to detect the presence of certain video cards and then use the drivers for those cards. If no recognizable cards are

present, the game will fall back to Direct3D. One of the reasons for this procedure is that no one knows for sure whether Direct3D will perform as well as chip-specific drivers.

"It's hard to say exactly what (Direct3D) will do since it hasn't been released," Reddick says.

Microsoft is banking on a successful Direct3D launch and fast Pentiums to make Win95 desktop computers the premier game machine next year. To show they mean business about moving into the game market, the Microsoftians are even selling their own multifunction joystick, the SideWinder 3D Pro (\$59.94).

We tried our own 3-D game test by putting Papyrus' *NASCAR Racing* simulation through the paces with a Diamond Multimedia Edge 3D 2200XL card. After the smoke of dozens of crashes cleared, we remained suitably impressed. The video on the Diamond-optimized version of *NASCAR* looked considerably better than the standard release of the game on a "normal" machine (see screen shots on this page). Skidding over and over again into other cars and walls seemed much more real in 3-D.

Undoubtedly, the impact of 3-D video technology will first be felt in the game market. Computer gamers have been pining for the kind of graphics that video game machines deliver, and 3-D comes a long way in making that dream a virtual reality. However, Reddick says, 3-D isn't just for playing around.

"As more chips get out there and the market presence increases," he says, "we'll start to see more and more people look to that technology."

Reddick says 3-D video has potential for all kinds of graphics presentations, computer-

aided design (CAD) software, and other business software. Around the home, multimedia 3-D titles will add to education and entertainment. One of the best ideas for 3-D software puts the power of realistic planning into the hands of average computer users. Various 3-D landscaping and home design programs are beginning to come out that would benefit greatly from enhanced graphics.

Of course, most of the programs available today will work fairly well on non-3-D cards. Unless you're heavily into games, a 3-D video card probably won't help you much at this stage. Fortunately, tomorrow's software should work with today's 3-D cards. Reddick says that when Direct3D is released, owners of existing cards will simply need to download certain software components from both Microsoft and their video card manufacturer.

"Anybody who buys a 3-D product today is buying for the future," he says. The only question is whether you want to pay for the future now when a lack of software makes the cards less useful.

■ 3-D Sound

Though we may have to wait a bit to realize the full benefits of 3-D video, 3-D sound is here today and works with all of your multimedia titles. 3-D audio hardware uses psychoacoustic techniques to modify the sound coming from normal speakers. Psychoacoustics is a big word that basically means tricking your ears and your brain into thinking you're hearing something that isn't there. Rather than using sound emitting from two speakers, psychoacoustically enhanced devices can make it seem as if speakers are sitting all over the place.



The standard DOS version of this popular *NASCAR Racing* game (left) handles well, but the 3-D version optimized for the Diamond Edge video card looks even better.

Seeing 3-D



The way advanced three-dimensional (3-D) graphics work their way through a computer can be divided into three basic stages:

1. Tessellation, in which objects are defined and converted into polygons, the building blocks of 3-D graphics;
2. Geometry, the stage where lighting and other factors are determined; and

3. Rendering, where the actual display is created on the two-dimensional (2-D) screen.

Usually, the CPU handles the first two stages while the add-on hardware accelerator takes care of rendering. In theory, the CPU could handle all three stages, but rendering would cause a big bottleneck, says Todd Reddick, product marketing manager for Diamond Multimedia.

"That's where most of the time is spent," he says.

Because full-motion video requires 30 frames per second, the computer must be able to construct or render each 2-D polygon scene in 1/30th of a second, which is a heavy load to say the least. CPUs like today's Pentiums are more than glad to hand off this task to a helper.

Dividing the tasks in this way also means that the CPU can begin tessellation of the next scene while the accelerator is still rendering the previous frame. This makes for an efficient use of the two processors.

However, as multimedia 3-D loads increase, some observers believe Intel CPUs might not be able to keep up even with add-on chips taking care of the third step. Intel is developing a 3-D accelerator chip of its own that performs parts of the geometry stage along with the rendering stage, eliminating a potential CPU roadblock and ensuring that Intel CPUs will be the choice of tomorrow's gamers. Since Intel can incorporate its new chip right into future Pentium Pro motherboards, it will likely do well in the market. ○

Different companies use different methods to achieve this bit of audio magic. Most people have heard of Dolby Surround Sound, a common feature built into many stereos and TVs. Dolby technology relies on different channels of sound sent to middle, side, and rear speakers. This can be combined with a rear speaker sound delay to make it seem as though the back speakers are farther away than they really are.

3-D sound technologies commonly used on PCs and increasingly for home audio are based on a different concept. Two of the most popular methods, Spatializer Audio Laboratories' Spatializer Audio Processor and SRS Lab's Sound Retrieval System, alter the frequencies of different sounds to achieve the desired effect.

Alan Kramer, director of engineering at SRS Labs, says his company's technology starts with the obvious idea that humans can tell from which direction a sound comes. Part of this is due to the volume and delay shifts used in conventional sound systems, but a lesser-known piece of the equation is frequency. Basically, Kramer says, the shape of the outer ear and head changes the frequency of incoming sounds as they rotate around the head. Sounds coming from the sides tend to have a higher frequency than sounds from the front, for instance. The brain can read these frequency shifts and use them to help determine the direction of noise.

"We know what all those signatures are, on average, over the whole head," he says. Normal recording and playback do not take

these frequency changes into account. SRS attempts to restore them.

A good way to understand 3-D sound effects is to start from the beginning. If we place two normal, monaural-output speakers at either end of a room and start playing through them the sound of a trumpet, our brain doesn't hear two trumpets. It puts the sounds together and creates a "phantom trumpet" at a point between the two speakers. By turning one speaker louder than the other, we can move this phantom trumpet to the right or left side.

With stereo, the two speakers work together. Some instruments can be played through one speaker and not the other, creating a phantom orchestra where different players seem to be seated to our right or left. Stereo works well, but only if we are sitting in the exact center of the sound. With Dolby Sound, center and rear speakers are added to give depth to our phantom orchestra. Now, to a person sitting in the exact center, or "sweet spot," of our growing speaker setup, various instruments can seem to be coming from all directions.

The necessity of the sweet spot is Dolby's downfall. The aim of 3-D sound is to make the speakers seem to disappear completely no matter where in the room the listener is sitting. With SRS and Spatializer, this can be achieved to a large degree with only two speakers because they use frequency shifts rather than position-specific volume and delay.

SRS usually is implemented on the playback side, which means anything recorded with normal methods can be given depth by an SRS-equipped playing device. Kramer says

SRS extracts the hidden frequency information from an existing source by subtracting one channel from the other. SRS divides the sounds into mono (left plus right) and ambience (left minus right and right minus left). The mono sounds seem to be in the center while the others broaden the space around.

3-D sound can be added to your PC in a variety of ways. Compaq's Presario systems now are sold with Spatializer's 3D sound built-in. SRS is used in Packard Bell multimedia computers. In other PCs, standard sound cards can be replaced by 3-D sound cards such as SoundBlaster's AWE32 PnP.

The most cost-effective way of adding 3-D sound is probably to buy a sound enhancer, a device that plugs in between your existing sound card and speakers. We tried a \$40 Spatializer enhancer manufactured by Labtec on a common PC setup: relatively small speakers placed on a desk. Although any sound would be better with quality speakers spaced further apart, our little test still was fairly impressive. A phantom orchestra didn't exactly materialize, but the sound definitely possessed more depth. No two-speaker enhancement is able to cause the listener to hear sounds directly behind them, but it is great for the 180-degree arc in front of the listener. Expect 3-D sound to show up on almost all new computers in the near future.

■ On The 'Net

Not surprisingly, 3-D technologies are beginning to combine with another hot computer trend: the Internet. Because of the low

connection speeds most Internet users deal with and the high complexity of 3-D graphics, advanced displays are slow to download and not entirely practical for the average Netizen, but it's obvious that the 'Net is starting to head away from the flat realms of today.

The key is Virtual Reality Modeling Language (VRML). VRML is to 3-D scenes what Hypertext Markup Language (HTML) is to two-dimensional pages. Both are standardized tags or codes that World Wide Web browsers can understand and display. VRML tags describe various simple shapes, such as spheres, cones, rectangles, and lines, that can be combined to build complex scenes. When a Web browser equipped to read VRML downloads a VRML page, these shapes come to life in the Web browser window. Rather than clicking words, users can fly or walk around a VRML scene with their keyboards and mice.

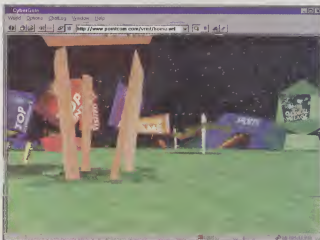
VRML opens up some exciting new possibilities for Web pages. Though the going is slow over a phone line, it is possible to download huge scenes simulating city streets, buildings, roads, or anything else. Just as with words or pictures in HTML pages, VRML shapes can be turned into hyperlinks that cause a new Web page to be downloaded when clicked by the mouse. In this way, one street or building can lead to the next, making the size of a virtual world virtually unlimited.

Though VRML pages are multiplying on the 'Net, the technology is just getting off the ground. Two similar standards are competing for dominance, and the opponents seem mighty familiar. The first is based on Netscape's Moving Worlds VRML 2.0 and is backed by the likes of Silicon Graphics and Sony. In the other corner stands Microsoft's Active VRML, which works with the company's Internet Explorer. Both new proposals include support for sounds, 3-D animation, and ways for Web users to interact with VRML objects.

To sample VRML for yourself, you'll first need a Web browser and a suitable VRML plug-in. Netscape users should check out <http://home.netscape.com> for more information. The Internet Explorer VRML plug-in can be downloaded from Microsoft's Web site at <http://www.microsoft.com/ie/addon/vrml.htm>. At each of these sites, the companies have

included links to sample pages to demonstrate VRML capabilities.

Looking at sites like these gives us some idea of VRML's potential. In the future world of high-speed, broadband connections, it will be easy to download large, complex VRML scenes. Users might be able to fly through a



The CyberGate browser lets users move about and talk with each other in VRML Internet worlds.

virtual shopping mall, stopping in stores that looked interesting and examining 3-D representations of products. A click of the mouse could select an item for greater detail or ordering. Other pages might let us take virtual tours of other cities. The possibilities are as endless as the Internet itself.

Eventually, 'Net users will be able to interact with each other in all VRML worlds. Today, that is only possible with special browsers such as Black Sun Interactive's *CyberGate*, an application that lets users type messages to one another in VRML worlds. Konstantin Guericke, Black Sun's vice president for sales and marketing, says *CyberGate* soon will be built into Netscape's *Navigator* browser.

With *CyberGate*, users first connect to an entry site where they pick a 3-D "avatar" to represent them in their online adventures with other chatters. Each person's avatar wanders through the VRML rooms and corridors, bumping into one another and visiting other sites.

Similar 3-D Internet chat worlds use proprietary, non-VRML languages to construct their fantasies. *Worlds Chat* was one of the first popular 3-D chat areas online. The software is available free at <http://www.worlds.net>. Using *Worlds Chat* is interesting at first, but eventually you realize it's basically just

another chat room with a much more limited domain than Black Sun has created for *CyberGate*.

Another site, *AlphaWorld* (<http://www.worlds.net/alphaworld>), takes the virtual place concept a step further by letting citizens build homes and streets of their own. Once you become a registered *AlphaWorld* citizen, you can stake out an empty area of the "world" for yourself and throw up walls, buildings, roads, or whatever you like.

The biggest problem with *AlphaWorld* is that it requires a Pentium and a 28.8 kilobits per second (Kbps) modem to run at anything better than a frustrating crawl. Even then, it takes some time to display scenery in crowded areas. Our forays to *AlphaWorld* revealed a large, confusing place where builders often construct grand palaces and then leave them sitting empty.

As the Internet grows and improves, VRML worlds will become places where people play and do business. 3-D video and audio techniques will grant these neverlands a degree of realism not seen today. Someday, they might actually seem nearly as real as the height of 3-D technology today: outside. ●

by Alan Phelps

For More Information:

Black Sun Interactive
(415) 263-6836
<http://www.blacksun.com>

Diamond Multimedia
(800) 468-5846
(408) 325-7100
<http://www.diamondmm.com>

Labtec
(360) 896-2000
<http://www.labtec.com>

SRS Labs
(714) 442-1070
<http://www.srslabs.com/>

Spatializer Audio Laboratories
(818) 227-3370
<http://www.spatializer.com/>

Recordable CDs Make The Cut

Cutting... burning... authoring. What once was on the lips of professional publishers is now coming from the mouths of savvy consumers. Get ready for a new era in techno-jargon as the CD takes a new turn—compact disc recording.

When most of us reflect on the compact disc, we think of it in ROM, or read-only memory, terms where you only can read information from the disc, not record data on it. CDs are great for playing programs, listening to music, or retrieving graphics—so great that sometimes we forget CDs are also handy for storing our own data.

Meet compact disc-recordable (CD-R) technology. As prices of recordable CD drives drop to less than \$1,000 and eventually reach \$500, this technology will become impossible to ignore. Here, we introduce you to the newest consumer fad, telling you how it works and what you need to get started. We'll also reveal a few disc technologies on the horizon that may give CD-R a challenge.

■ Burn, Baby, Burn

Cutting and burning refer to how CDs are created. CD drives use a kind of optical storage

technology, flashing light in the form of laser beams to read data stored on spinning discs.

Ordinary CD-ROMs are made up of a special material called polycarbonate. On top of the polycarbonate is a nonreflective layer. On top of that is a reflective layer. Finally, there is a clear, protective outer coating.

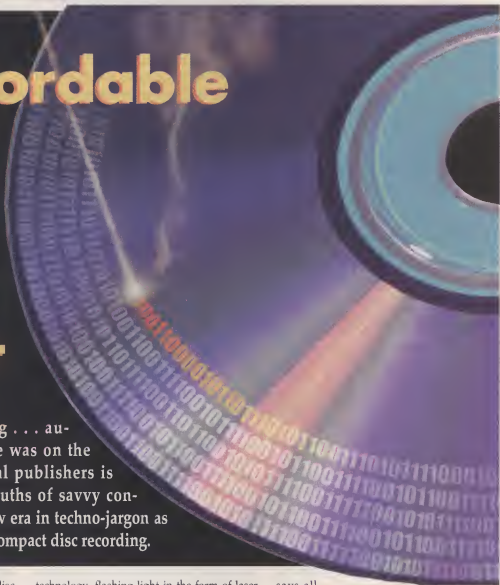
When software companies create CD-ROMs for distribution, they use a stamp or molding method. Information is stamped onto the discs, cutting through the reflective layer in some spots to the nonreflective area, leaving pits and lands. Pits are the dents on a CD, while lands are the unmarred areas. These pits and lands then represent the Os and Is of binary code (the building blocks of computer data).

When the laser in the CD drive passes over the disc, it detects the reflected or nonreflected areas, then passes along the information to your computer. Chuck Bridges, marketing manager for data storage products at Sony,

says all the stamping is done through large replication presses. But replication presses aren't ideal for the average user, who needs a compact device that will fit in the computer or sit beside it on a desk. Hence the CD-R drive technology, which was introduced a couple of years ago. CD-R still uses the idea of nonreflected and reflected areas and lasers to read and write data in binary code, but the material it writes to is a little different.

Rob van Eijk, director of strategic marketing for Philips laser optics, says the material on a CD-R is a dye—dye polymer, to be exact. When you record a file to the disc, a laser heats up the dye material. This changes the wavelength of the returned light, which actually alters the reflection. That change is permanent; once you write the information to the dye, it stays that way.

Consider when you shine a flashlight in a mirror, van Eijk says. If you would change the



color of the mirror, you would get a different return. That's how CD-R technology makes its nonreflected pits and reflected lands represent binary data. Because of this laser-heating method, many have nicknamed the process "burning" a CD.

Even though CD-R uses a little different technology than CD-ROM, CD-R discs are widely accepted. The discs can be read on any brand of CD-R drive as well as on any old CD-ROM drive. And by year's end, CD-R discs will be compatible with a new CD technology called compact disc-erasable (CD-E). (See the sidebar "A New Twist On CDs.")

■ Getting Started

It doesn't take a computer programming degree to get started creating your own CDs—although it wouldn't hurt to have one—because the software and hardware are becoming easier to install and use.

To burn your own CDs, you'll need a CD-R drive, CD-R discs, and authoring software. (Authoring is one of many terms that refers to how documents are organized on CDs.) Fortunately, most manufacturers will bundle a few discs and a "lite" version of the software in the box with their CD-R drives.

The drives, we discovered, are no more difficult to install than a CD-ROM drive. We did have a little trouble setting up the Philips External CDD2000 Recorder (800/235-7373) to work at the same time as our sound card, but we discovered our troubles resulted from dealing with two SCSI cards rather than with the drive

itself. We did have to get a special RCA "Y" stereo jack to connect the drive to our speakers, however. (SCSI, or small computer system interface, is used to connect computers to peripheral devices. The peripheral devices all attach to one SCSI port through a series of connects called a daisy chain, each with its own priority address.)

We also discovered the drives are no speed demons. Most record and read information to and from the CDs at **double-speed (2X)** or **quad-speed (4X)**, which determines how quickly the drive can read and transfer data to the computer. It can take 20 minutes to an hour to record about 650 megabytes (MB) of data, depending upon the software and drive. Although you can find 6X, 8X, and now 10X CD-R drives on the market, it may be a while before CD-R drives catch up.

We found CD-R drives from many of the same companies that produce CD-ROM drives (Sony, Philips, Hewlett-Packard), along with a few new names we hadn't heard before (Smart and Friendly). Prices for these drives have dipped below the \$1,000 mark and can be found as low as about \$800. But there are also CD-R drives available for more than \$2,500.

Although it's still quite an investment to buy a CD-R drive, the CD-R discs

are relatively cheap—about \$5 to \$8 per disc. This is especially reasonable when you compare the cost of other storage devices. For example, Iomega's Zip 100MB cartridges are priced at about \$20 each, and SyQuest 650MB cartridges cost between \$60 and \$70 apiece. To exchange data on these media with another user, you both must have a Zip drive or a SyQuest drive. To exchange data using CD-R, however, the person on the other end needs only a CD-ROM drive.

As for authoring software, you can spend hundreds or thousands of dollars on a package, depending upon what you want it to do. If you want to do some real multimedia publishing, the expensive packages might be worth a look. But most new users will likely settle for the programs on the lower end, to begin with anyway. These programs help you maneuver data onto the disc, add audio tracks or sound files, and work with photo CDs. Some even help design artwork for the jewel case cover and include wizards that walk you through the storage process, step-by-step.

You probably won't be able to create CDs of the quality you might buy from a software publisher with the low-end authoring software, but it can be a great start for simply storing data.

The blue-green dye polymer used to store data on CD-R discs (top) creates a different color than ordinary CD-ROMs.



A New Twist On CDs

CD-R isn't the only new disc in town. Compact disc-erasable (CD-E), also becoming more well-known as CD-rewritable, was unveiled about a year ago when 10 companies (including IBM, Philips, Sony, and Hewlett-Packard) got together and decided there would be a use for rewritable CDs. The final specification was released this summer for CD-rewritable technology, and the first drives are expected to be available by year's end.

When CD-E drives store data, they don't deal with dye or "cut" a disc by pressing in pits. The technology they use is called **phase change**. The material actually changes when it is heated by a laser, says Rob van Eijk, director of strategic marketing for Philips laser optics. The material changes from an amorphous state to a crystalline state, each generating a different level of reflectivity. These different levels then are

read as the pits and lands might be on an ordinary CD-ROM.

But where's the difference between CD-R and CD-E? "It's actually the state of the material that changes (in CD-rewritable), not in terms of color but in terms of composition," van Eijk explains. "Phase change is reversible. Phase change I can get back to its natural state and rewrite. The dye (in CD-R) is permanent. Once you change it, you cannot get it back to the original reflection. Therefore, CD-R is write-once, and CD-E is erasable."

Of all the CD drives, CD-rewritable drives will be the most flexible. They will be able to play CD-ROMs; play and record CD-R discs; and play, write, and rewrite CD-rewritable discs. At this time, van Eijk says, CD-rewritable discs can be rewritten about 1,000 times. By the end of the year when the technology is available, that count hopefully will be up to about 10,000 times. ●

Popular names in the \$200 price range include *Corel CD Creator*, *Easy-CD Pro* by Incat, *Gear* by Elektrosn, or *Moniker's Spira*. When we tried to record files on CD-R discs with Corel CD Creator (800/772-6735), we found it relatively easy. We picked the files and directories we wanted, then told the program where to put them.

A new development introduced by Sony this summer makes it a no-brainer to record CD-R files on the Windows 95 operating system. Called CDRFS, or compact disc recordable file system, the new technology lets users drag and drop files from the hard drive folder to a CD-R drive folder. Sony's Bridges says it's a lot like having a 650MB diskette drive. While the development won't affect Windows 3.1 users much, Corel plans to build it into its software for Win95 users, and Sony plans to include it in its *Spessa* drives (800/352-7669).

■ 650MB To Spare

What would you do with 650MB? With all that space, it shouldn't be hard to think of something.

Probably the first things that come to mind are basic storage and backup. With most hard drives holding more than one gigabyte (GB) of information, it would take a pile of diskettes to back up, or make a copy of, all your data. But it only would take one or two CD-R discs to ensure your data is safe.

CD-R discs also make a great medium for freeing up more storage on the hard drive. If you want to store large documents, graphics files, or sound files but don't want to give up the hard drive space, a CD-R disc could store the files. Put the discs away for safekeeping, bringing them out when they're needed. Most of the information available on the Internet almost requires you to use a large, alternative storage device. Find a program online that you may need in the future? Download it onto the CD-R disc. Want to download a World Wide Web page, complete with data and graphics? Store the files, which can take up around 40MB, on a CD-R disc.

Because CD-R discs can handle large files with ease, they're great for storing multimedia items, such as photo files and video files. Use them to store pictures you have scanned into the computer or video you've captured to create CD scrapbooks and video CDs.

Because CD-ROM drives are prevalent on home and business computers, CD-R discs ease information distribution. You can use them to create multimedia presentations with

large graphics, video, charts, music, and other sounds. Bridges says many of Sony's corporate customers use CD-R discs for marketing information: brochures, advertising campaigns, multimedia presentations, computer-based training, and so on.

■ The Future Of The CD

While CD-R sounds very "cutting edge," it's just the beginning. By the end of this year, CD-E drives will hit the market with the ability to play, record, erase, and rewrite data. The flexibility of these drives will give them quite an edge.

Common Questions

* Can you play a CD-R on a CD-ROM drive?

Yes, CD-R discs are portable. You can play back a CD-R on a CD-ROM drive, on a CD-R drive, and at the end of the year, on a CD-erasable drive.

* Can CD-R drives play ordinary CD-ROMs?

Definitely. They can play CD-ROMs as well as audio CDs. However, most CD-R drives only operate at 2X and 4X speeds, which is slower than the 6X and 8X CD-ROM drives now available.

* How can you tell a CD-R from a regular CD-ROM?

Ordinary CD-ROMs usually have a silver color. CD-R discs look golden and may have a blue/green tinge on the recording side because of the dye polymer used to store the data. Although the two use different technologies to store data, they both store up to about 650MB of information.

* Are CD-Rs more "delicate" than CD-ROMs?

No. However, both are susceptible to damage from scratches or fingerprints. Oil in fingerprints can make it more difficult for the laser in the drive to write information through to the dye polymer underneath.

* Can you record data on a CD-R more than once?

It depends upon your software and drive. If they both support multisection recording, you can go back a number of times to record files on the CDs. Each time you record is called a session. ●

So should you wait to buy a CD-E drive? Not necessarily. Mary Bourdon, senior systems analyst at Dataquest, says she's doubtful that CD-E technology will replace CD-R when it's introduced. First of all, CD-E drive prices won't make them competitive. By the end of the year, she predicts prices of CD-R drives will drop to about \$500 to \$600. Manufacturers are certain to introduce CD-E drives at a price about 50% higher so they don't wipe out their CD-R market. The actual CD-E discs also will be more expensive, Bourdon estimates. While CD-R discs are in the \$5 range, CD-E discs are expected to be introduced at about \$20 apiece.

"A person making (a CD-E drive) purchase obviously has something more in mind than just recording CDs," Bourdon says. "If that's all he has in mind, then the CD-recordable drive would be the better recording device."

In a year or so, CD-E drive prices may drop low enough to become more attractive. If that happens, you may find yourself buying both kinds of discs: recordable and rewritable. Consider the diskettes you now own. If you're like most people, you have a number of diskettes you store data on once for safekeeping and then put away. And you probably have one or two expendable diskettes that you take with you and rewrite a number of times. CDs will be no different. You'll have a bunch of CD-R discs for archiving or to send off to other people and don't expect back. But you'll also keep a couple of \$20 CD-E discs that you use all the time; they'll pay for themselves after four rewrites when compared to buying four new CD-R discs.

But the CD won't always be king. A major competitor waits in the wings for its grand entrance sometime at the end of this year or the beginning of 1997. Digital Video Discs (DVD) will hold 4.7GB to 17GB of information, enough room to store a full-length movie. Bourdon says DVD-ROM drives should be introduced for around \$500. But, again, they're unlikely to immediately unseat CDs. CD-ROM drives can be found "on sale" today for less than \$50. Also, there will be limited programs available for the DVD players immediately, except maybe for movies.

That \$500 might be too much for consumers to pay at first just to watch movies on their PC. But watch out when prices hit the \$100 mark in a year or two, Bourdon says. Then, DVD will become the drive of choice for consumers and for developers who create software. ●

by Cindy Krushenisky

WHAT'S IN a NAME?



FLEXIBILITY



 **VERSATILE™**

ALLSOP INTRODUCING the Ultimate desktop storage unit for all media types, the Allsop Multimedia Patented Ingenuity VersaTile™ offers storage for CDs, 3.5" Diskettes and much much more. For easy access to your own media library, check out the new Allsop Multimedia VersaTile™. Available at major computer retailers.

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It's All Greek To Me:

Creating And Printing Documents In Foreign Languages

Thanks to modern technology, we can no longer assume that everyone we'll need to deal with speaks our language. It's becoming more and more important that we learn other languages so we can communicate with people worldwide. Once you've learned that second (or third) language, though, how are you going to create documents in it?

If the language you're working with uses characters found in English, perhaps with a few accents thrown in or an extra letter or two, you may be able to accomplish what you need with the software you already own. However, if you're using a language with a different character set, such as Russian, Arabic, or Japanese, you may need new software and possibly even a special printer. MS-DOS, Windows, and Windows 95 include options for keyboard layouts for languages with alphabets similar to English. However, these keyboard layouts usually don't accommodate non-English character sets. (For more information on changing keyboard layouts, see "Basic Training" in the July 1996 issue of *PC Novice*.)

If you're only adding an occasional foreign word to a document in English, you may be able to do that by using the Character Map in Windows to insert unusual characters. Minimize the document you're working on and open the Character Map by double-clicking its icon in the Accessories program group. Make sure the Font box lists the same font you're using for your document.

There are several sets of characters in the Character Map, including Latin, Cyrillic, and Arabic. The font you're using will determine which ones are available for you to use. If you're using Times New Roman, for example, the Windows Characters page contains the characters used in languages such as French and Spanish with the appropriate accents. You can use a character from a different font, but it

won't match the rest of your text. If you must use a certain font to get a character you need, you may want to change the whole document to that font or use another method to create the character.

If you decide to use the Character Map to transfer a character to your document, double-click the character you want. It will appear in the Character To Copy box. Click Copy to copy the character to the Clipboard, then click Close to exit the Character Map. Open your document, place the cursor where you want the character, and either press CTRL-V or click the Paste icon on the toolbar. (If you inserted a character in a different font or font size from your document, you'll need to change back to the original font and size before typing anything else.)

Most major word processors also let you use some international characters. For example, typing in another language can be done one of two ways in *Microsoft Word for Windows*. You can change the keyboard setting to be compatible with another language, or you can use the keystroke combinations that will produce the foreign characters using an American keyboard. You can find these key combinations listed in Word Help by searching for "Languages, Other." Select Creating International Letters With A U.S. Keyboard. For example, if you're writing in French, press CTRL-, (comma) and then type c to get the character ç.

■ Specialized Software

If you're working with a different set of characters, such as Russian or Arabic, it isn't that simple. For languages such as Hebrew, which are read and written right-to-left, word processing can be particularly challenging. There is, however, software available to let you do word processing in languages with different character sets.

Windows offers localized versions, including Arabic and Japanese versions. If you

do most of your work in such a language, that may be your best option. However, you are again limited to just one language. What if you use more than one alternate language or do most of your work in English but need the ability to create and print documents in another language from time to time?

Accent Software offers a range of products that let you do just that. Accent's LanguageWare line includes word processors that let users choose from more than 30 languages, regardless of which version of Windows they use. Their most sophisticated word processor, *Accent Professional 2.0*, is bidirectional as well as multilingual, so it not only supplies the fonts but also handles right-to-left writing.

At this time, Accent's products don't include Asian languages, which are even more complicated because they read in columns instead of horizontal lines. Accent does, however, plan to include Japanese and Chinese in future releases.

Accent is one of only a few companies offering this type of product. Another, Gamma Productions Inc., offers *Gamma UniType International*. This program changes the keyboard layout to the layout for the language chosen, changes to the appropriate UniType font for that language, and activates spell



checking, hyphenation dictionaries, and other language-specific features. The program isn't a word processor; it acts as an add-on to Windows word processors. UniType uses TrueType fonts with optional PostScript fonts for a few of the languages it supports.

■ Hardware Considerations

You don't need a special keyboard to type in foreign languages. The keyboard mapping functions of the software we've discussed enable any keyboard supported by the operating system to support the languages included in the software.

Most inkjet and laser printers can handle the character sets for languages such as Russian and Arabic. You may, however, need to change a printer setting for the printer to allow the unusual characters. For example, the Epson Stylus Pro color inkjet printer has character tables for Russian and Greek character sets, among others, but you need to switch character tables to enable the printer to print with those character sets. (The default character table is for the United States.) To change character tables, turn on the Default setting mode and change the settings using the control panel buttons.

Eric Killian of Hewlett-Packard Technical Marketing says that while many printers don't have the fonts for these other languages included with them, most printers can handle them because they're usually TrueType fonts. (All of the fonts in the Accent packages described above are TrueType.) If you're using PostScript fonts, you'll need *Adobe Type Manager* to enable your printer to use them. (The fonts are included with the software used to create documents in the language of choice.)

Asian languages, on the other hand, can be a problem for many printers. These languages tend to require special drivers because there are so many characters in languages such as Japanese, Chinese, and Korean that each character has to be represented using two bytes instead of one. Killian explains that Hewlett-Packard has special printers designed to accommodate these character sets. For example,

the Korean model of the printer has a driver that makes it possible to print in Korean.

■ What The Pros Use

We talked to several people who must create documents in languages containing their own character sets. We found that many of them, particularly those whose first language isn't English, use software in the non-English language. For example, some military personnel who need to work with documents in Arabic use the Arabic version of Windows.

For languages such as Russian and Arabic, you may need to change a printer setting for the printer to allow the unusual characters.

However, for users who work primarily in English but also need to create documents in another language, that's probably not the best solution because it still limits the user to one language. Patsy Vinogradov, an American college student who taught English to adults in Chelyabinsk, Russia, says Release 1.5 of UniType with Word for Windows when she needs to type a document in Russian. (In addition to her work teaching English, she corresponds with her Russian husband's family in their native language.) Vinogradov says she particularly likes that UniType places a keyboard diagram on the screen so she can glance at it to see where certain characters are on the keyboard. She says the program also came with stickers to place on her keyboard if she preferred that kind of visual cue to the on-screen representation. She uses UniType with a Hewlett-Packard DeskJet 660 and didn't have to adjust any printer settings to get it to work.

In addition to programs such as UniType and Accent's LanguageWare, there are add-ons for major word processors. Dr. Gerald Fetz, chairman of the Department of Foreign Languages and Literatures at the University of

Montana in Missoula, teaches German and uses *WordPerfect 5.1* for DOS with a German add-on. The department uses the add-ons for Russian, German, Spanish, and French.

"They're separate modules that you purchase, and then you can add them in and just switch back and forth easily from English to the foreign language," Fetz says. "We have a language lab where we have all the modules. We usually give the students an orientation at the beginning of the semester. The directions are in both languages; if they're familiar with

WordPerfect in English, all they have to do is get used to a couple of switches on the keyboard, typically with diacritical marks."

Dr. Fetz adds that the students have keyboard overlays with the keyboard layouts for the different languages, and they also can print out the keyboard layout.

There seem to be as many solutions to foreign-language printing needs as there are languages.

Whether it's learning what you can do with the software you already own or purchasing a new package that offers more multilingual options, you can create documents in almost any language you can learn. ●

by Diana K. McLean

For More Information:

Accent Express 2.0

\$69 (all prices are suggested retail price)

Accent Special Edition 2.0

\$199

Accent Professional 2.0

\$399

Accent Software International

(800) 535-5256

(714) 223-0620

<http://www.accentsoft.com>

Gamma UniType International, Release 1.71

\$345

Gamma Productions Inc.

(800) 974-2662

(619) 794-6399

<http://www.gammapro.com>

Printing Out-Of-The-Ordinary Projects

It's possible that you're boring your printer. Perhaps you don't consider yourself a dull person, but your printer might. If all you ask it to churn out day after day are the same old tedious letters, reports, and envelopes, it's really missing out—and so are you.

Printers shouldn't be restricted to printing standard letterhead or labels. And you shouldn't be restricted to using the letterhead or labels in a conventional manner.

What can you do with your printer? The list is only as limited as your imagination. The only things you'll need to get creative are a printer, the right software, and the right printing media.

■ The Right Stuff

A color printer is essential for creating crafts. A black-and-white printer can handle just about whatever you want to undertake, but your projects may lack the extra pizzazz you get with color. Most printers now are capable of printing decent-quality photographs, which adds a personal touch to your projects. Of course, you'll need a scanner to change your photos into the digital image files the computer can understand, or you can place your photos on Kodak PhotoCD when you get your film developed. (To work with the photos, you'll also need Kodak's *PhotoCD Access Plus* software for about \$10 [800/235-6325].)

Whether they're color or black-and-white, some types of printers have advantages over others. While inkjets excel at printing on T-shirt transfer paper, laser printers fall short in this area because they use toner rather than ink. The high temperature required to attach the dry toner from the T-shirt transfer to the fabric would burn the T-shirt. Also, most laser

and inkjet printers require taping the individual sheets together to create banners (although one printer company has a solution that we'll discuss later). The dot matrix is still the perfect printer for banners because dot matrix paper is perforated and already connected. It's also the only type of printer that can create

crafts that require multipart forms to punch information through to pages underneath. On the other hand, the dot matrix can't necessarily print at as high a quality as an inkjet or laser printer. (See "Your Old PC" in this issue.)

The right software may already be under your nose. You can design a lot of projects with your word processor and a basic painting/drawing program, although you may want to consider picking up a clip-art package for a wider art selection. Many of the low- and mid-range printers targeted at home consumers also include handy design software for all sorts of projects. (For instance, Epson inkjets come with a publishing program and font package, Canon bundles a combination of publishing and drawing programs called *Canon Creative*, and Hewlett-Packard packages a Mickey Mouse fun pack with some of its printers.) In addition, there are numerous programs available on the software shelves intended for desktop publishing and other unique projects.

The media—paper, borders, or other materials—can be found at your local computer/office store, craft store, or discount superstore.

Some of the specialty materials are bundled with software, and some can be ordered from paper companies, such as Paper Direct (800/A-PAPERS) and Avery Dennison (800/25-AVERY), or directly from printer companies, such as Canon.

■ Imagine The Possibilities

It doesn't hurt to start small. Your first endeavor doesn't have to be an elaborate masterpiece. And it doesn't have to require special software or printing materials. For



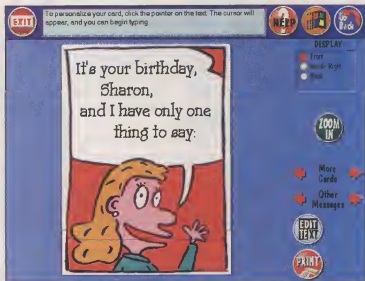
instance, use a basic paint program, such as the Windows Paintbrush application, or a more full-featured drawing program to design a coloring book. Incorporate a few pieces of black-and-white clip art if you are artistically challenged and print the images on plain printer paper. Staple the pages together, and you've got a personalized coloring book for your children. They even can pick and draw images to place in the book and put their names on the front cover.

Another popular project that takes little work is a banner. Banners can say things such as "Happy Birthday" or "It's A Girl" in large type that runs across a number of pages. Dot matrix printers are perfect for banners because the pages are already connected. Inkjet and laser printers print banners one page at a time, requiring you to tape the pages together to form the message. To remedy this, Hewlett-Packard recently introduced a special inkjet banner paper that travels through its inkjet printers just like perforated paper does through a dot matrix printer. It's uncommon to find a banner feature on a word processor. However, most low- and mid-range desktop publishing programs, such as Corel's *Print House* (800/772-6735), Broderbund's *Print Shop Deluxe* (800/521-6263), and *Microsoft Publisher* (800/426-9400), offer banner features. Generally, you enter the text you want, pick a font and any clip-art images to appear with your message, and the printer takes care of the rest.

Along with banners, most of these desktop publishing programs have options to create signs for your business, a party, or a garage sale. You also can create simple signs with a word processor. The advantage of the publishing programs is that most already have templates designed; you just plug in your own pictures and information. And these signs can have other practical uses. For instance, Mike Isgrig, product manager for imaging promotions at Epson, suggests making garden stakes. Place signs designating your carrots or radishes on small posts, and you'll have the sharpest-looking garden around.

Once you've gotten those fruits and vegetables out of the garden and into jars or freezer bags, you'll need to label them. Use ordinary label paper you find in a computer/office store; most word processors include a label option that lets you indicate the size of the labels you are using. You can make them simple or add color and clip art. While making labels, don't stop with the kitchen. You can create labels for just about anything from video cassettes to audio cassettes to CDs. Labels can be purchased in all shapes and sizes in office stores or from companies such as Avery Dennison. If you can't find the size you want, cut a bigger one down to size.

You could have a magnet of Fido or one next to the phone with all of your frequently dialed phone numbers and emergency numbers. You print the designs on paper, attach them to the sticky side of sheet magnets, and cut them down to size. If this sounds like a lot of work to coordinate, PrintPaks Inc. (800/774-6860) produces a *Magnet Kit* for about \$25 that comes with the software, paper, and magnet materials you need to assemble your own magnets. Although you can include your own drawings and photos, the *Magnet Kit* software limits you to only four shapes and a handful of borders. PrintPaks also sells refill packs for about \$10, but you probably can find the materials at a craft store for a cheaper price.



Create greeting cards on **Hallmark Connections Card Studio** with your own text, photos, and artwork or use one of the predesigned images and messages.

Labels aren't just great for marking things; they're also great for producing stickers. How many times have you purchased sheets of stickers for your kids? Why not buy a clip-art package with fun images or draw your own in a drawing/painting program, then print the images on label paper and cut them to the size and shape you want? If you really want to get creative, use your own photos. What a way for kids to mark their belongings! If you don't want to go to too much trouble, try a sticker software program, such as the *Sticker Store Junior* from DogByte Development (800/9-DOGBYTE); this product includes hundreds of sticker designs for about \$25.

Or, how about hanging your children's projects on the refrigerator with their own magnets?

If you discover too many projects are winding up on your refrigerator, try hanging them in the window. The stained-glass art fad lets you place art on transparency sheets, just like you might use on an overhead projector. Create your own graphics or use photos, then print them on transparencies instead of paper. (Don't forget to select transparencies as your media option in the printer setup.) Next, visit an office store to get a cardboard transparency border, punch a hole in the top, thread a string through for hanging, and you have stained-glass art. PrintPaks also offers a *Window Art Kit* for about \$25 that packages everything in one place: the software, transparency paper, custom frames, attachment tape, cords, and suction

cups. You may find the product a little limiting, but it's a good way to get started.

All of the projects mentioned so far can be personalized with your own photographs. But don't confine yourself to quirky home items; you can use photos on all kinds of things. Michelle Spring, a spokesperson for Hewlett-Packard, says some of its customers use photos to make their own postcards. Consider how much fun it would be to send someone a postcard about your vacation with you in the cover photo.

Postcards are just the beginning. Think of all the birthday cards you buy. Feel as if you should own stock in Hallmark? Most low- and mid-range desktop publishing programs include options for greeting cards, announcements, invitations, thank-you notes, birthday

cards, holiday cards, and so on. Or, there are a few specialty packages available. For instance, Hallmark and Micrografix have combined their creative skills to make *Hallmark Connections Card Studio* (800/733-3729). If you aren't feeling overly original, you can pick from Hallmark's designs and prewritten messages or use your own artwork, photos, and greetings. The program even prints the Hallmark "Made just for you" logo on the back for those who care enough to send the very best.

Kids can create their own cards with PrintPaks' *Pop-Up Greeting Kit* for \$25. There are a restricted number of choices, but the cards are a little more kid-oriented; inside the card, a character or image pops up when opened. If

tents or making nametags you design in a word processor or drawing program. If it's a children's party, PrintPaks offers a *Party-Fun Kit* with everything you need for a party of 10, including invitations, party hats, wacky eyeglasses, and banners. If you really want to go wild, you can draw and print your own wrapping paper.

How about letting your printer do the laundry? Well, it can't actually wash your clothes, but it can help decorate them. Most inkjet printers can print on T-shirt transfer paper, which is available from printer companies or in craft stores. You fashion your T-shirt design on any drawing or desktop publishing program, then print it on the special transfer paper. Don't forget to print on the correct side of the paper and to select the proper media option in the printer setup. Otherwise, your image may come out backward. (For example, you would select Back Print Film on some Canon BubbleJet models.)

Next, iron the transfer anywhere you want: on T-shirts, ties, hats, totebags, pants, shoes, etc. The heat causes the ink to melt off the paper and latch onto your fabric. Just be sure to peel the transfer off immediately after you're done ironing and don't expect it to come out perfect the first time. You'll probably need to practice on one or two items before you get the knack. If you want all the materials assembled for you, PrintPaks offers an *Awesome Iron-*

Ons Kit for \$30 with everything you need, even one large T-shirt. But your printing doesn't have to stop with simple clothing items. HP's Spring says one of its customers uses an inkjet printer to design quilt squares before she sews them together.

If you want to take clothing design one step further, *Dress Shop 2.0* by LivingSoft (800/626-1262) lets you customize the fit of its clothing patterns with your measurements for about \$95. It can print on almost any type of printer, but you have to tape together the pattern pieces along clearly marked lines before you pin them to fabric.

The list of printing ideas seems endless. For instance, promote your business or just have fun creating paper visors or door hangers. Paper Direct offers both items in plain-white or colorful background designs. (Paper Direct's *PaperTemplate Software*, which works with *Microsoft Publisher* for Windows 95, helps you lay out the text for the visors as well as other Paper Direct products for about \$20.)

How about pinwheels? PrintPaks has a *Personalized Pinwheels Kit* for \$25 with everything you need to create made-to-order pinwheels. Or, scan photos into the computer and use your own drawings to construct customized calendars. Almost all of the publishing products we mentioned include templates to make it easy to assemble calendars for yourself or to give as gifts. Finally, print your own buttons using button kits, which can be found in most craft stores and from some paper companies, such as Paper Direct. You print the image or message on paper, then cut the paper to fit your button. One clear, plastic portion fits over the front, while another piece with the button pin snaps on the back.

■ A New Twist

Of course, magnets, postcards, and garden stakes are just the beginning of what you can do. Most of the ideas we've presented here are old ones with a new twist.

You may run across a roadblock once in a while, but most of the time you can find a way around it. For example, all printers have limitations for the thickness of paper they can print on, listed in the printer specifications. If your paper is too thick or you want to print on cardboard, print the designs on large labels and stick them to the thick material. Or, perhaps you want portions of your documents to appear in color, and you only have a black-and-white laser printer. Companies such as Paper Direct offer colored foils you cut and position over the areas to appear in color. Run the paper and foil through the laser printer; heat transfers the color to the toner. Then peel back the foil, and the text will appear in shiny color.

If these ideas have you thinking, be warned. Once you start stretching the limits of your printer, it'll be difficult for you or your printer to go back to those boring, old documents. ●

by Cindy Krushenisky



To find out just how easy it is to "be creative," we did some printing of our own. We designed a T-shirt, magnets, greeting cards, and stained-glass art on a Canon BJC-4100 BubbleJet printer.

you want your greetings to appear just like store-bought cards, thicker paper stock is available from paper companies, or you might find some in office supply stores. Included in Card Studio are samples and an order form from Le Desktop (800/LE-DESKTOP), which offers attractive specialty paper and recycled paper. The Le Desktop Deluxe Starter Kit comes with 160 sheets of paper and 100 envelopes for \$39.95. PrintPaks offers its own refill kit for \$10.

Once you've used your computer to print invitations and banners, finish your party preparations by creating placemats and table

Creating Your Own Business Forms



Who designs preprinted forms? Whoever did obviously didn't design them for your typewriter. Those lines and boxes were designed either for a Munchkin or the Jolly Green Giant; either way, the print on your typewriter doesn't fit. You have to re-align the page every other blank to type within the lines.

Furthermore, preprinted forms with an average number of columns and generic column titles may be economical for small companies on even smaller budgets, but the generic forms may not even suit your company's special needs. You end up with sloppy forms after you squeeze text into too-small columns and cross out preprinted column titles to write in more accurate ones.

Fortunately, creating the entire form, lines and all, on the computer solves the problem of inserting information into tiny spaces apparently designed for miniature typewriters. Your forms can provide individualized data; maintain a neat, professional appearance; and give you and your typewriter a much-longer-for separation. A review of some of

the popular business forms packages showed they provide these services as promised. Not all of the programs give users the tools to edit their forms, but all of the templates allow a little flexibility to make a form that fits your company's image and budget.

■ Create-Your-Own Packages

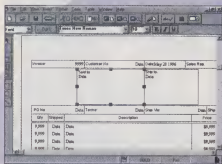
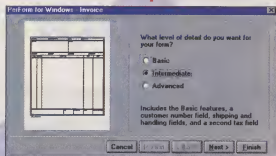
Creating your own business document might seem like a monumental task, but most of the packages make it pretty easy to construct a form that will suit your company's needs. The reviewed programs typically provided two options for form construction, either modifying one of the templates provided by the program or beginning the whole project from scratch.

Designing a form from scratch either can be tedious and frustrating or merely time-consuming, depending upon the tools provided by the particular program you've selected. Among the reviewed programs, *FormTool Gold 2.0* by IMSI (\$65 street price; 800/833-4674, 415/257-3000) gives you the most creative freedom in its

create-your-own option. However, the freedom has a price in the form of quick and easy manageability. The program opens to a blank sheet surrounded by tool buttons. Now what? Clicking around gives no clues to building your own form. The *FormTool Gold* manual does provide lessons on using the construction tools, but learning to make a professional-looking form from scratch with this program might seem like more trouble than the benefit of creating your own forms is worth.

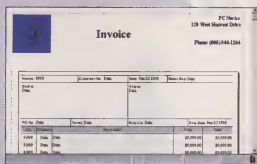
The fastest and easiest way to create your own business form is to start with a predesigned template and make additions and corrections until you have a useful form that's specific to your needs. *Delrina's PerForm* (\$80; 800/268-6082, 416/441-3676) offers the most flexible template of any of the programs we looked at. *PerForm* also contains a start-from-scratch option, but the template is adaptable enough to let you design the right form without starting over completely. *PerForm* lets you rearrange the form's format, change the size and number of columns, and change the cells to suit your needs.

Step 1



Step 2

Delrina's *PerForm*, the most flexible program among those we reviewed, takes you through the step-by-step process of creating forms from a template. In Step 1, you choose the template. In Step 2, you modify the template to fit your needs. Step 3 is the finished product.



Step 3

You fill in general business information, name, address, fax number, and phone numbers only once. The information will be automatically included in any forms you generate using the program. *PerForm* provides several templates (formal, standard, modern, and professional) for each kind of form to help you recognize the style of form that sets the tone for your business. Some form types, however, lack the full range of templates.

FormWizard by FormBuster (\$57; 800/829-8754, 805/545-8515), like *FormTool* and *PerForm*, has a variety of templates, but it doesn't let you manipulate all elements of the forms very easily, if at all. For example, *FormWizard* makes it difficult to shorten the number of lines on the table portion of the form. To delete portions of a form, you must highlight the portion of the page you want to save rather than the portion you want to cut. Because you can highlight only one portion at a time, we found it impossible to save just the top and bottom portions of a table.

Among the programs we tested, only *PerForm* offers complete freedom to change all aspects of the table within the template.

Your logo and/or pictorial graphic is one of the document elements that's most personal to your company, making it a good way

of identifying your forms. Each form program imports graphics easily. Some require that the image be a .BMP file or a .GIF graphics file, so you might have to consider the file format (or conversion possibilities) of your current logo when making your form tool decision.

All the programs require some kind of tutorial documentation to help guide you through the form construction process. This isn't the type of program that tends to be a jump-in-and-go project. The group came through with the necessary instructions, but they weren't always easy to follow and certainly not quick.

Don't try using *FormTool*, for example, without working through the thorough, but fairly time-consuming, set of preparatory lessons that explain how to create your own document from scratch and/or using a template. These lessons explain the tools *FormTool* provides but offer little guidance on the basics of constructing particular types of forms. It's a good tool for someone with a specific idea of what the form should look like as well as an hour or so to sit down and go through the schooling to learn to create it.

FormWizard weighed in lightest on the documentation feature, often leaving us guessing about the next possible move.

■ Fill In The Blanks

Now that you have a form on your system, it's time to add information. All the reviewed programs let you type information into the blank fields on the individual forms, but the more efficient method of inputting data is to import the information from a database of some kind.

FormWizard had the most flexible database system. It can be arranged to merge information from any database with Open DataBase Connectivity (ODBC), a database standard from Microsoft that's used by virtually every PC database, such as *dBase*, *Access*, etc. If you have an ODBC-compatible database, you can use the data already located in your files to fill in the fields on your new template. *FormWizard* doesn't provide its own database utility, but it does give an easy way to use a database package for more than just storing data. *PerForm* isn't set up for importing information from databases. It requires you to enter data on each form, a more time-consuming option than constructing one template that can be merged with your data at the press of a button.

■ Strictly Templates

For smaller companies on a limited budget, the programs that let you design

forms may not be cost-effective and might actually be more muscle than you need. Template packages such as *101 Business Forms* by CompuWorks (\$25; 800/229-2714, 612/559-5140) contain a wide variety of forms that let you input your own company information as well as the data for each specific document and print out a clean finished product.

101 Business Forms creates the initial template document in an easy four-step process without requiring the frenzied manual skimming of the more elaborate template programs. The first step prompts you to input your company's logo, address, phone number, and other general information. The program takes this data and arranges it in four different ways. You select one to be used as headers for your documents. With this decision, most of your creative power ends.

The second step is to select the forms you need. A wide variety is available, from invoices to envelopes. Each document has up to four different types of forms to choose from, but the forms are basic and plain and don't let users make changes on the actual forms.

Steps three and four take you through filling the templates you created with information and printing them for send-off.

■ Using Word Processors

All of this form power might still be more than you need. If your budget currently allows no additional funds for special forms packages, check your word processing program for alternatives. Every document you create in the big three word processors (*WordPerfect*, *Microsoft Word*, and *Lotus Word Pro 96*) uses a template of some kind. When you open to a blank page, the default template sets the margins and font for a basic document. (*Word Pro 96* asks you to select a template each time you begin a document.)

The basic word processor templates offer little variety. There is generally only one possible document for each form type: one invoice, one envelope, one fax cover letter, etc. The form can't be altered much. You can include your company's information, and you usually can import graphics if you can find a place for them, but otherwise, what you see on the original template is what you get.

Word processors can be used in a pinch for a handful of documents if you don't use business forms very often, but if your business uses a variety of forms regularly, purchasing a designer package is a wise investment.

The problems with preprinted forms that we've mentioned may not affect you; the

forms you're currently using may fit your needs perfectly. If this is the case, you could scan them in and add fields so you can type in information electronically. That way, the occasional goof can be taken care of with a backspace instead of yards of sticky white tape.

One product, *HotForms* by CapSoft (\$450 estimated price; 800/500-DOCS, 801/763-3900) takes a scanned image of your current document and gives you the tools to enter the fields that would let you electronically input your data. *HotForms* also acts as a spreadsheet in some ways. You can set up mathematical equations so the form will calculate its own row and column totals. However, as with any template that makes its own calculations, you should always check the computer's figures against those you found with a more human touch—on the calculator.

Remember that adding your touch is the main goal of creating and filling out forms electronically. You'll treat yourself to documents that save time and present a more personalized company image, not to mention retiring the typewriter to a dim corner of your office. ●

by Elizabeth Panska

Form Letters

All the programs that give you the tools to present numerical data in professional-looking forms only help with a portion of your business paperwork.

Even if the invoices and expense reports look good, you may still struggle for the right words to complete the presentation. Constructing a sales letter or a reply to a disgruntled customer might seem like an easy task until you sit with pen in hand, struggling for the right words. When a simple two or three paragraphs might seem like a college dissertation, a little automated help may be welcome.

808 Great Letters gives you templates that let you plug in a name here and an event there and pull together the perfect letter. Not all of the letters in the package are appropriate for the business office. Some are more personal, but the fairly

extensive letter bank includes a missive to cover almost any need. The program's biggest asset is also its most glaring flaw: Most of the words aren't yours.

Though these letters might be quick and easy, they're coming from the pen of another hand. Read the letters carefully and double-check for inappropriate material. *808 Great Letters* tends to embellish frequently so watch for phrases that might read a little dramatically. Remember that the letters are templates; you can make any changes you feel necessary to make the letter read the way you want.

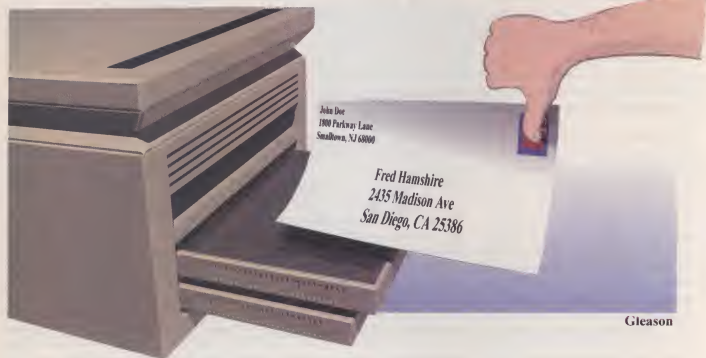
Lifetime Encyclopedia of Letters is an alternative to the form letter template. Again, this program includes personal letters as well as business-related correspondence, but there is a good variety of business letters. The package provides examples of good business letters as well as a helpful guide to creating

good letters of your own. The software lets you edit the examples it provides and use them as templates, but they are designed as helping tools and not a quick solution.

With business form templates and business letter forms, you'll be able to zip through your business paperwork. But be careful when taking these shortcuts; don't rely on them wholeheartedly. There's no substitute for your input. ○

808 Great Letters
\$79.95 (suggested retail price)
Star Software
(415) 778-3100

Lifetime Encyclopedia of Letters
\$49.95 (suggested retail)
Streetwise Software
(800) 743-6765, (310) 829-7827



Gleason

Finish Your Letter's Appearance By Learning How To Print Envelopes

After using the laser printer to print the final draft of a letter, you carefully fold it in thirds with nice even creases, slip it into an envelope that matches the paper, and proceed to chicken-scratch the address onto it or head to the typewriter for an address.

The professional look falls through in this scenario. Unfortunately, it's made common by cantankerous relationships between envelopes and printers that often make it faster and easier to write an envelope by hand or crank up the old typewriter to finish the job. But printing an envelope, and adding that finished touch to an otherwise flawless piece of correspondence, doesn't have to be that difficult. The following steps help users of the major word processors produce addressed envelopes that look as good as the letters they contain.

■ Printing Envelopes

Microsoft Word. In the Tools menu, click the Envelopes And Labels option. Click the Envelopes tab to display the envelope format options. Type the address of the party you're sending the letter to in the box titled Delivery Address. Type the return address in the corresponding box marked Return Address.

Word provides a shortcut for those who consistently use the same return address. If you've already opened the Envelopes And Labels window, close it. To set your address as the default, choose Options from the Tools pull-down menu and click the User Info tab. Fill in the boxes marked Name, Initials, and User Address. Once this information has been included in the User Info box, your return address will appear automatically in the Return Address box as the default for both envelopes and labels. When you need to use a different

address, just type in the substitute in the Return Address box. You can turn off the return address altogether for envelopes with a preprinted return address by reopening the Envelopes And Labels window and checking the small Omit box that appears to the right of the Return Address title.

The size selection is listed in the Envelope Options window, which is accessed by the Options button. Click the down arrow to the right of the box titled Envelope Size and select the size you need.

To customize the look of your envelope, you can select the font for both the mailing address and the return address separately. To change the font, click the Font button under either Return Address or Mailing Address, depending upon your preference. Choose a font from the list of available ones. The Font Selection option in the Envelopes Format

window doesn't provide a preview window so either go with a font you know or return to the word processing window and experiment with the look of the ones that are unfamiliar.

Once you've got the envelope set, you either can print it immediately by clicking the Print button or attach it to the document you'll be using it with by clicking the Add To Document button. Attaching an envelope to a document works well for a mail merge document or a letter that you use often. The attached envelope is most convenient for printers that have attached envelope trays, but they also work with manual feed.

Set the envelope feed for your particular type of printer by clicking the Feed button. Choose whether the envelope goes in face up, face down, sideways, and/or flap first. The drawings shown in the Feed menu should look like the one by the envelope feed on your printer.

WordPerfect 6.1. This popular word processor provides the tools to design your envelope to very specific standards, but printing doesn't need to be complicated. We've listed all of the options below and how to use them, but you won't need to use them all on a regular basis. We recommend going with the defaults as often as possible.

Select the Envelope option from the Format pull-down menu. Type the mailing address and the return address in their respective boxes. Both of these boxes display a list of previously used addresses in smaller prompt boxes below. To display the full list, click the down arrow to the right of the box. To add a new address to the list, type in an address in the larger box, then click the Add button. When printing envelopes with a preprinted return address, remove the X in the Print Return Address box located under the Return Addresses box.

The Envelope Definitions box in the Envelope Window lists the standard

envelope sizes. Click the down arrow to the right of the box to select the envelope size that suits your needs. For any envelope that does not meet one of the standards listed, click the Create New Definition button. You would need to create a definition for a nonstandard envelope for off-the-wall cards or brochures. This is an occasion you'll rarely run into.

To format for an unusual envelope, you must first give the new definition a title in Paper Name. Select Envelope In Paper Type. In the Size box, select User Defined Size from the group listed. Enter the envelope's size in inches in the boxes under the Size box using the up and down arrows. Select whether the envelope will be fed through manually or come from a paper tray in the Location box. Click OK when you're finished.

The Options button fine-tunes envelope format. For example, you can move the mailing or return address as little as one 1/100 of an inch at a time. The positions are expressed by the distance to the top and left margins and adjusted by clicking the up and down arrows to the right of the box. This is another option you will only use on occasion since the options are preset for each envelope standard. If you're making these changes for personal preference, decide first whether that degree of perfection is worth the frustration of moving the addresses.

The decision to include the U.S. Postal Service bar code is also made in the Options menu. You can decide whether to put the code above the mailing address, below the mailing address, or to omit the bar code entirely.

Once you've got the envelope formatted the way you'd like it, you either can print it as its own document or add

it to the main document by clicking the Append To Doc button.

Word Pro 96. Select Envelope from the Create pull-down menu. Left-click the Address button. Give a title to the new mailing address in Address Name and type the information in. You'll notice it's unclear whether the name will print as part of the address; it won't. You must retype the name of the addressee as part of the main mailing address. Left-click the Add button to add this address to your database for later use.

Word Pro 96 doesn't give you a prompt for the return address; it takes the information directly from the User Setup file. To list a different return address, left-click that field and type in the correct information. To set your default address information, select User Setup from the File pull-down menu, then select Word Pro Preferences. Left-click the Personal tab to bring that page to the top. Personal contains prompts for your name, address, postal code, phone and fax numbers, and other general information. Fill in the appropriate fields and left-click OK.

The Size box lists the standard envelope sizes. To select the one you need, left-click the down arrow to the right of the box. Highlight the envelope size that suits your needs and left-click. Left-clicking the Postal Code button includes the U.S. Bar Code on the envelope.

Select the place the printer can draw the envelope from, either manual, tray 1, or tray 2, from the pull-down menu labeled Bin. The draft version of your letter might be formatted a little oddly—ours was. If the envelope seems to be turned at a 90-degree angle, check the paper orientation in Page Layout. To enter Page Layout, select Document Properties from the File menu and select Page from the properties listed.

Once your envelope is formatted and ready to go, you can print the envelope as an individual piece or as part of the whole document by indicating which pages to print in the Print dialog box accessed through the Print button. Word Pro 96 automatically attaches the envelope to the document so you can print everything at once when the document is finished.

■ Tips & Tricks

We can go step-by-step through the software instructions for printing envelopes, but lessons on the more mechanical side of printing envelopes aren't quite so easy. You can feed envelopes

**Adding that
finished touch to
an otherwise
flawless piece of
correspondence
doesn't have to
be that difficult**



Envelopes or Labels?

Even with the best envelope printing system available, sometimes printing envelopes isn't your best option. For example, most printers aren't equipped for big, page-sized envelopes. They're too large and thick and generally represent a jam waiting to happen. If you're using large envelopes and don't want to revert to hand-addressed or typed envelopes, you could use your printer to make an address label.

Though dot matrix printers might not print envelopes well, they're great for labels. Unlike inkjet or laser printers, dot matrix can print one label at a time. The perforated sheets of single mailing labels can run through one label or fifty with equal effort. You just have to change the paper and send your print job through. Inkjet and laser printers are disadvantaged in the label department. Because most of them are not equipped to feed one label through at a time, you need to print labels in bulk to make it worthwhile.

Printing bulk labels is just as easy on the inkjet or laser printers as it is on the dot

matrix. You can format a document within your word processor to print three columns of labels, fill them out, and print them. At the printing stage, you have two options. The first is printing the formatted document onto the appropriate label sheet. This option is the fastest and most convenient, but we don't recommend it. Printers are temperamental, and if there is the tiniest corner of one label rolling up, the printer will find it and use it as an excuse to take a vacation for a while.

The other choice is to print the document onto a blank sheet of paper and use the copy machine to transfer the names and address onto the actual labels. This process takes an extra step, you may lose image quality in the copying process, and you still run a small risk of gumming up the copier's works, but copy machines seem to be a little more sturdy than finicky printers.

If you do a lot of bulk mailing, you should look into specialized label printers. These are designed to print only labels and can print one label at a time or prepare for a bulk mailing.

They can print mailing labels, file labels,

diskette labels, etc. Label printers run from \$150 to \$500. Three of the top label printers are: the LabelWriter series from CoStar (800/426-7827, 203/661-9700), the Smart Label printers from Seiko Instruments USA (800/688-0817, 408/922-5900), and P-Touch PC from Brother International Corp. (800/284-4357, 908/356-8880).

These specialty printers press special label rolls through on rollers. Since the printers plug into your serial port, you can keep them connected and toggle back and forth between your label printer and regular printer as needed. However, the serial port will be occupied and unavailable for other peripheral devices.

The label printers are most convenient for users who print a few labels on a regular basis, but all of these methods work better than trying to send a large envelope through your printer. A mailing label may not look quite as nice as a printed envelope, but both look nicer and are much easier to read than the old handwritten standby. ○

through the printer face down, face up, through the side, or top (flap side) first, depending upon the printer. The best advice we can offer, other than reading the printer's manual, is to look for an illustration or icon by the manual feed slot or the dedicated envelope tray (if your printer has one). These illustrations aren't always accurate either, however, and you may have to resort to trial and error the first time. For example, the illustration on our Canon BJC 4100 showed the envelope feeding through face down. After two or three tries, we realized that we needed to feed it through face up. Once you learn how your printer likes its envelopes, grab a pen and paper and draw your own illustration or some other kind of instruction. Post it right by the printer so you have a handy reference.

Although we can't really offer detailed instructions for running an envelope through your printer, we can provide a few general tips.

- Always feed the envelope through with the flap closed unless your manual tells you

otherwise. The printer needs four straight edges to roll a piece of paper through without getting snagged. The flap is just an extra tab of paper waiting to get caught on something.

- Don't try to force an envelope that is either too large or too small for the feeder. Printers are designed for specific envelope standards such as a #9 or a #10 envelope. A larger envelope will jam as the paper wrinkles trying to go through. A smaller envelope can get lost in the machinery.
- Don't print an envelope with metal flap holders or any other little extra piece. Printers are finicky, and the paper rolling through their machinery must remain flat and flexible at all times. Don't give the printer anything extra to chew on.
- Watch the way the word processor tries to format the envelope page. If it looks as if it's sideways, chances are it will print that way.
- Remember to leave out the return address when printing envelopes with a preprinted return address.

- Remember that dot matrix printers don't print envelopes very well. Without being attached to the tractor feed, the envelopes are allowed to slip around too much. Printing envelopes can be done with a careful eye and a steady hand, but we recommend printing a label instead.
- If you know you're going to print a lot of envelopes when you purchase your computer, look for one that comes with a dedicated envelope tray. The convenience is worth the little extra money.

Whether your printer uses an envelope tray or you have to hand feed it, the process should go smoothly after a little practice. Allow yourself two or three envelopes to play with. Once you've got the hang of it, make a note of the way to send it through so your envelopes appear as professional as the messages they carry. ●

by Elizabeth Panska



Colors By Fuji (Of course.)

Hey, who turned on the color in the computer products aisle?
Fuji. Who else? Their 3.5" 2HD Formatted Rainbow
Packs are a brighter, more efficient way to organize your data.
And they're a lot more fun, too, of course.



Computer Products

You could rummage through old cookbooks for that lobster bisque recipe, or use our recipe finder to try something new.

Even if you're 2,000 miles from civilization, you can still get the latest news from WOW! online.

Now up to six people in your home can have their own email address.

Not sure whether you need the Internet? Don't worry.

So you want all the privileges of a private online service, but you still want the freedom to roam the Internet? Now there's an online service that gives you both. Appropriately, it's called WOW!"

WOW! from CompuServe® has everything a powerful online service can offer—email, shopping, sports, games, 24-hour news, chat groups, and a variety of information services. And everything the Internet can give you—including access to the World Wide Web with thousands of Web sites.

But WOW! isn't just another online service. It's technology made practical. Instead of layers

WOW! is like two online services in one. Our adult design gives you unlimited access to WOW! and the Internet while the WOW! Kids design lets children explore protected online areas.

of confusing screens, WOW!'s simple design lets you tailor the service to suit your personal interests. And its colorful CD-ROM-based graphics make searching for information just as exhilarating as finding it.

WOW! even has a special design for kids. Children will be able to click their way through a friendly and fascinating online neighborhood. And with WOW!'s built-in safeguards, parents will be able to

control which areas of the service their kids can visit.

WOW! makes traveling to the far reaches of cyberspace as easy as a spin



One visit to Roger Ebert's Movie Reviews and you'll see why people are giving it the thumbs-up.

around the block. When you find something intriguing, a simple click lets you add it to a guidebook called "My Places."

So with all your favorite finds in one convenient spot, you can return to them in seconds.

With WOW! you also get a built-in version of Microsoft's powerful Internet Explorer™ browser for cruising the World Wide Web. And since WOW! has something for everyone in your family, we're giving you 30 whole days to





On WOW!, not only can you book a flight anywhere in the world, but you can learn about the culture before you get there.



WOW! has the latest scores, highlights, and up-to-date information on all your favorite sports.



I want it now!

☐ **Yes!** I want to explore WOW! FREE for 30 days. Send my free WOW! Start-up Kit right away.

Name _____

Address _____ Apt. _____

City _____ State _____ Zip _____

() _____

Home Phone _____

For faster service, call **1-800-9-GETWOW ext. 51**

WOW! is available for Windows 95 only.

Minimum System Requirements: Multimedia PC (486 or better) running Windows 95, 8MB RAM (16MB RAM recommended), CD-ROM drive, modem (9600 baud or better), and a sound card.

This offer includes one full month (30 days) of unlimited access time, including Internet connection. Members can cancel at any time during their first month and one billing.

When do you plan to purchase Windows 95?

- ☐ I already have it. ☐ 3-6 months
☐ 0-3 months ☐ 6-12 months

Would you like to reserve your copy of WOW! for Macintosh?

- ☐ yes ☐ no

What is your modem's speed?

- ☐ 2400 ☐ 9600
☐ 14.4k ☐ 28.8k

Do you have a CD-ROM drive?

- ☐ yes ☐ no

HURRY!
Send for your
FREE
Start-up Kit
today!



I want it now!

☐ **Yes!** I want to explore WOW! FREE for 30 days. Send my free WOW! Start-up Kit right away.

Name _____

Address _____ Apt. _____

City _____ State _____ Zip _____

() _____

Home Phone _____

For faster service, call **1-800-9-GETWOW ext. 51**

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- ☐ 2400 ☐ 9600
☐ 14.4k ☐ 28.8k

Do you have a CD-ROM drive?

- ☐ yes ☐ no

HURRY!
Send for your
FREE
Start-up Kit
today!

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Free Start-up Kit

WOW ext. 51



online made easy.



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So you want all the private online service, but the freedom to roam the Internet? There's an online service that does both. Appropriately, it's



But WOW! isn't just an online service. It's truly made practical. Instead

WOW! is like two online serv
Our adult design gives you w
access to WOW! and the Inte
the WOW! Kids design lets ch
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Even if you're 2,000 miles from civilization, you can still get the latest news from WOW! online.

Now up to six people in your home can have their own email address.

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On WOW!, not only can you book a flight anywhere in the world, but you can learn about the culture before you get there.



WOW! has the latest scores, highlights, and up-to-date information on all your favorite sports.



eed an online service or ry, we'll give you both.

explore WOW! absolutely free, with unlimited time online (not just 10 or 15 hours like most other online services).

After your first free 30 days, WOW! can be yours for just \$17.95 per month. This flat fee gets you all of WOW!, WOW! Kids, plus Internet access—all day, every day. You'll never have to pay any additional hourly fees or add-on charges. Just one low flat fee—and never a penny more.

To use WOW! all you need is a multimedia PC (486 or faster) running



Windows 95, a CD-ROM drive, and a modem. To start your 30-day free trial, just call 1-800-9-GETWOW (that's 1-800-943-8969) for your free WOW! Start-up Kit today.

Call now for your free Start-up Kit

1-800-9-GETWOW ext. 51



ISDN

Speeds Online Access

When computer salesmen talk about POTS, they probably aren't talking about cooking utensils. Among telecommunications folks, POTS is slang for Plain Old Telephone Service. What makes it so plain and old? Integrated Services Digital Networks (ISDN), a service available through regular telephone wire that's faster and more flexible than the POTS-based computing you're probably used to. Do you want to cut time spent waiting for modems to transfer information by 75%? Want to experience live video or studio-quality sound over the Internet? Depending upon your online tasks, it might be smart to toss your old POTS and get cooking with ISDN.

Understanding ISDN means understanding the two methods of carrying information over copper phone wire. The old POTS way, analog, is the same technology used to record sounds onto an audio tape. The ISDN way, digital, is how sound is recorded onto a CD. **Modems** (short for Modulator/DEModulator) translate digital information from PCs into analog signals that phone lines can carry. The modem on the receiving PC translates the analog signal back into digital information. However, with ISDN, the transmission simply stays digital. About 90% of all existing wires can carry digital information; the phone company's network must simply be "told" to receive digitally.

On the analog tape, you may hear static and background noise, but a digital CD virtually eliminates that noise. Similarly, an analog signal on POTS suffers from static, while a digital signal on ISDN usually doesn't. A digital ISDN connection, in addition to being more reliable, is up to four times faster than a 28.8 kilobits per second (Kbps) modem, the fastest analog modem readily available. Because computers deal with digital information, ISDN makes sense for computer networks.

■ Flavors Of ISDN

Before asking your local telephone company whether it offers ISDN, understand the varieties of ISDN and whether they fit your needs.

The two main types of ISDN lines are **Basic Rate Interface (BRI)** and **Primary Rate Interface (PRI)**. They're often billed per minute with additional monthly fees, depending upon how the lines are used.

BRI service, designed for homes and small businesses, usually costs from \$35 to \$200 per month, plus metered charges up to 10 cents per minute. BRI installation charges start at around \$35 and can exceed \$125. A single BRI wire consists of three parts, or channels. Two B channels, or bearer channels, carry voice and computer data. The two channels are separate, so two different devices can use one ISDN line at the same time. The channels also can be combined in a process called **bonding**, or inverse multiplexing, to act as one big, fast channel. Because bonding doubles the speed of BRI data transfers, making even live video feasible, make sure your ISDN equipment takes advantage of it.

The third channel in BRI, the D channel, carries information about your call. D channels also can provide 9600bps connections from one computer's serial port to another.

A company with a LAN can create a wide-area network (WAN) over ISDN lines. Often, businesses use PRI service, where one line consists of 23 B channels and one D channel. PRI service usually costs thousands of dollars per month, and installation and equipment often cost thousands more than BRI devices. The T1 circuits PRI service runs over already extend to some businesses.

Before buying ISDN equipment, ask your phone company to verify that your lines can carry service. Where existing lines don't support ISDN, extending a BRI line to your house can mean a single \$100 fee or as much as \$25.50 every month you have the line. If ISDN is unavailable through the local phone company, long-distance phone companies may offer it in your area.

Always ask potential ISDN providers whether there are certain models of equipment to avoid with their service. While national standards exist for ISDN compatibility, they are relatively new and only cover up to certain speeds of transmission.

■ ISDN Utensils

Depending upon your needs, total costs for ISDN hardware can start at less than \$500, but they're more likely to be closer to \$1,000. Since devices can have extra, overlapping functions, it's best to plan before you buy.

In the United States, every ISDN customer must have an NT-1 (network terminator 1), which adapts ISDN phones and other devices to plug into the phone company's wire. An NT-1 sells for \$100 to \$600, with many staying less than \$200. An alternative, the NT-2, is an NT-1 with extra features, such as the ability to let multiple appliances attach to the same B channel. An NT-1 can be built into other digital equipment. An ISDN "modem" with a built-in NT-1 can cost as little as \$385.

A plain telephone or modem won't work over ISDN service, so if you'd rather not spend between \$200 to \$1,900 for a digital phone, consider purchasing your ISDN line in addition to, rather than in place of, your analog line. Separate lines can simplify ISDN equipment setup and prevent loss of phone service while you troubleshoot ISDN gear. Also, ISDN devices, unlike many analog phones, use external power and will fail during power outages. Backup battery power supplies are available starting at \$150, but a separate analog line remains more dependable during emergencies.

While two lines might sound more expensive than one, a separate analog line can save you money with its flat monthly fee. However, voice service on digital phones can be enticing; digital



lines offer many services associated with large offices, such as conference calls and ring again.

Analog converters, which start at around \$100, let you plug analog equipment into ISDN lines for incoming calls, but some require a digital phone with keypad to allow analog devices to make outgoing calls.

Many digital gadgets, such as some NT-1s, have built-in RJ-11 jacks, which are ports for analog lines. RJ-11 jacks are often available on **terminal adapters** and ISDN cards. (A terminal adapter (TA) plugs into your computer's serial port and is often called a digital modem.) Unfortunately, many serial ports only handle speeds up to 19.2Kbps, which is slower than high-end analog modems. An internal ISDN card can circumvent serial port slowness, but the card and its software can be more difficult to install. Retail prices for ISDN cards start around \$500; ISDN cards that are combined ISDN/analog modems retail from \$600 to \$900.

Bridges and routers, which deliver data among network sections, are designed for networking gurus. Often, they lack RJ-11 ports because they mainly connect office computers, which don't handle analog information. Retailing at \$1,000 to \$3,500, ISDN bridges and routers create WANs, giving a user calling from across town the network access he would get from across the hall. Bridges and routers offer flexible types of connections such as Ethernet, but each connecting computer probably will require an Ethernet card, which retail at around \$100 apiece.

■ Pitfalls In ISDN

While ISDN service is faster than analog technology, it usually costs more, and even if you have ISDN equipment, the places you use your modem may not. Most local bulletin board services offer analog service only.

Even large companies such as America Online and CompuServe presently lack ISDN support. But when you read this, CompuServe may have fulfilled its goal of providing toll-free ISDN access this summer. Netcom, a major Internet service provider, offers ISDN access only in the San Francisco Bay area, but it plans to expand it across the country within the next three to six months. If your current services don't offer ISDN access, you'll need a service provider that provides ISDN access.

ISDN technical support can be difficult to find. Some sales and tech support operators have never heard of ISDN, but this should become less common as ISDN grows more popular. While plugging in ISDN equipment is easy, there are difficult "translations," which are setup codes a user must enter into the equipment along with SPIDs (Service Profile IDs, given by the phone company).

Combine the relatively new technology of ISDN with another relatively new technology—Windows 95, for example—and you'll probably be at the mercy of user manuals and tech support. Fortunately, many vendors and manufacturers use tech support as a selling point, and for a price, ISDN consultants help with everything from choosing services to equipment setup.

■ Good-bye To POTS?

In deciding whether it's time to do away with POTS, consider how you'd use ISDN and whether it's worth the cost. If you spend little time using a modem or use analog-only services, ISDN is not an outstanding choice.

If you use a modem extensively to work from home, the speed and quality of ISDN may well be worth the cost. In a case study cited by US Robotics, a file that took 23 minutes to send via modem took only 25 seconds over an ISDN BRI line.

For small businesses wanting to maintain a periodically accessed network or special phone features such as conference calls and call park, ISDN is a good choice. Many larger businesses, however, will benefit more from service billed at a fixed rate, rather than per-minute access, and should check with local phone companies for billing options or ISDN alternatives.

As larger service providers expand into ISDN and with aggressive marketing from ISDN equipment makers, it's unlikely that ISDN will be a passing fad. As Microsoft says on one of its World Wide Web pages, other technologies are being developed, "but it will take time to deploy these technologies." For several years, ISDN will be the most economical networking solution for homes and small businesses.

ISDN will evolve, so be prepared for better equipment and additional costs of upgrading to take advantage of it. With preparation and planning, you can get cooking with ISDN without getting burned. ●

by Shaene M. Steinauer

Average Costs For ISDN

	Personal Use	Home Office	Small Business (per office)	Large Business (per 15 offices)
Based on	10 hours use of one ISDN line per month (BRI)	25 hours use of one ISDN line per month (BRI)	40 hours use of ISDN line per month for digital services (BRI); 80 hours use of ISDN line per month for voice calls (BRI)	Unlimited usage with one PRI line (24 total channels) for both voice and data
Minimal Equipment	ISDN Modem with Integrated NT-1: \$385	ISDN/analog modem with built-in NT-1: \$600	ISDN/analog modem with built-in NT-1: \$600; Digital phone with 3-line capability, call transfer, and hold: \$660 Equipment Total: \$1,260	Two ISDN phones with 10-line capability @ \$660 each; \$1,320; 13 standard digital phones @ \$200 apiece; \$2,600; consultation with ISDN solutions provider (recommended); \$1,000; upwards of \$5,000 for minimal ISDN equipment for 15 machines. Equipment Total: \$9,920+
Startup (installation) Fee	\$80	\$80	\$80	\$4,000
Monthly Recurring Fees	ISDN Service: \$85 Analog phone line for phone service: \$40 Monthly Total: \$125	ISDN Service: \$110 Analog phone line for phone service: \$40 Monthly Total: \$150	\$200 (plan for unlimited usage) Optional analog voice telephone service (recommended): \$40 Monthly Total: \$240	\$2,000 Optional analog voice telephone service (recommended): \$40 Monthly Total: \$2,040

Technology Boot Camps

Polite, professional instructors instead of screaming drill sergeants; elevators rather than rope climbs; 5 p.m. cocktails instead of 6 a.m. calisthenics; 500-mile airplane trips instead of 20-mile runs; hors d'oeuvres rather than mess halls.

It's obvious that corporate computer training programs won't prepare anyone for combat, but the thousands of men and women who participate in these technological boot camps take them as seriously as any newly sworn recruit takes the first weeks of military training. Competition, like war, is hell, and as the global market expands, business survival becomes more of a struggle. Keeping up with technology is certainly one of the best ways to remain competitive.

■ Who Needs Training?

Unfortunately, many company presidents, CEOs, and other executives come from the generation that preceded the PC revolution, and they lack the technological expertise needed to make profitable decisions in a bits-and-bytes world. As computers and the Internet become more prevalent in modern business, corporate decision makers can no longer afford to assume that Web sites are attics and software refers to white cotton briefs. Corporate computer training brings decision makers up to speed on the technical issues.

"Ideally, (corporate computer training) exposes a business to a new technology, demystifies the technology solutions, and helps the business see the relevance of the technology to its overall business success and growth," says Grace Testani, president of New York based Creative Computing Center Inc. "The goal is to get as much information as possible in the shortest amount of time."

But simply understanding the newest technologies and their relevance to a particular



business isn't enough. Executives must decide whether to take advantage of the technology and then determine how to integrate it seamlessly into the established daily routine of the business. Without successful implementation, no technology can reach its maximum profitability.

The other side of corporate computer training—the practical enforcement and application of a new technology—enters the picture at this point. "Employees must know how to use their software," says Debbie Steele, president of SteeleTech, a consulting, training, and development company based in Logansport, Ind. "An integral part of any hardware or software investment should be training, or the benefits of improved technology will be lost on unproductive workers."

"In companies where training is not provided," Steele goes on to explain, "end users

create a support network of internal people who are 'masters' of the (new technology). Diverting these 'masters' from their work to act as computer trainers is expensive to an organization, not to mention the cost of time wasted by the struggling employees."

■ Benefits Of Training

The amount of time and money saved by corporate computer training is not the only benefit of corporate computer training, although it is an integral part of it. Actually, some may argue that a company will save even more time and money by using training manuals and audio tapes.

While this point is debatable, corporate computer training programs offer a few advantages with which manuals and audio tapes cannot compete.

First, corporate computer training programs have at least one physically present instructor available to lead employees through the training process as well as to answer any questions that might arise. Some instructors provide a follow-up visit to ensure that implementation of the new technology has transpired as planned. Other instructors plan a "roving" training period, where they pass from desk to desk, spending a period of time with each user.

"(The presence of the instructor) provides an effective way to reinforce the topics covered in class, as well as address specific questions relating to the user's daily work," says Brett Anderson, account manager for Trillium Consulting in Bellevue, Wash.

Second, corporate computer training programs often provide training sessions that specifically cater to executives who may not have the time or patience to endure more traditional training methods. These men and women are accustomed to giving the instructions, not receiving them. Further, they have



concerns different from the employee end user and need an instructor who can afford the time to individually address these business concerns.

"Many executives have not set aside time to learn computer skills, and they feel intimidated to join classes with their employees," says Paul Clothier, president of the California-based The Training Edge. "Executive computer training classes are kinder to their egos. In a short, intensive class, they can grasp a basic overview of what is going on and what they might need to keep abreast of."

A third advantage to using corporate computer training programs is that instructors often offer helpful operating hints and problem-shooting tips that can improve productivity and efficiency. Many of these off-the-cuff tips usually aren't listed in training manuals or product brochures but are acquired through extensive use of a product. Some of these hints may do little more than provide an alternative method of accomplishing a certain task, but some could save a company extensive amounts of time and money.

Finally, a fourth advantage of corporate computer training programs is that they often are designed specifically to accommodate the needs of the business they're currently addressing. Even in a group training session, quality trainers attempt to personalize the information. Joe Giordano, technical training manager and certified Netware instructor with the New Horizons Computer Learning Center in Boston, estimates that his sales department spends 75% of its time customizing training sessions for its clients.

"One of our newest and most popular classes is called 'Educators on the Internet.' It is targeted toward middle school and senior high school teachers," Giordano says, illustrating the universal, yet specific, nature of corporate computer training. "To date, we have seen every type of executive and nonexecutive alike attend our classes."

■ Finding A Quality Program

Not every corporate computer training program goes to the trouble of conforming to a

certain company's special demands, but taking the time to find a training program that will do so is well worth the time and money. There are a number of factors to consider before choosing a training program for your business.

Cost shouldn't be the ultimate consideration when selecting a training program. "Obviously, good computer training will save money in the long haul," says Carolyn Woodie, director of technical training at Annapolis, Md.-based Woodie Computer Associates (WCA). "However, most companies spend the smallest number of dollars on the training. Training is not all the same animal, and the cheapest is not always the best. I have had many, many people tell me that they spend thousands of dollars on worthless training."

Finding a quality training program requires a little homework. Most companies look primarily at the training materials when considering a training program: Is it a hands-on experience or lots of lectures? Will it be a rather dry presentation, or are the materials presented in a more entertaining manner? The training materials are usually the first thing offered to a prospective customer, and they usually offer lots of good information.

But so do most training manuals and audio tapes, for that matter. Take a closer look at the individual or team that will conduct the training program. Consider the experience the instructor has had with the specific hardware component or software application for which your company requires the training. Some instructors are certified by the manufacturer of the product for which they conduct training to indicate their knowledge of the product.

More importantly, consider the instructor's training experience. Look at the instructor's past training ratings and comments from past trainees. Meet instructors if possible; watch them in a training situation or ask for a brief sample presentation. Listen to how the instructor explains things; are the instructions

clear? An instructor should be comfortable and confident speaking to others about computers. Keep in mind the size of the prospective audience and the length of the training. A clean, professional appearance and a relaxed, friendly demeanor are also important during long training sessions.

■ And Flexible Too!

The beauty of computer training programs is that they usually can be adjusted to fit practically any schedule. Training can occur at special training facilities, in hotel convention rooms, or at the work site. Workdays, evenings, and weekends are all fair game for scheduling sessions.

The costs of attending a training program vary as you move from low-cost, half-day sessions that cover one particular aspect of computing to week-long seminars that cost several thousand dollars and cover an entire area of the industry. The average price per person for a one-day seminar is usually in the \$150 to \$300 price range. Executive training sessions are more expensive.

Of course, always consider the necessity of training before rushing out to hire an instructor. Visit with an independent computer consultant to determine the training needs of your company. Check with fellow employees and executives to determine the amount of computer illiteracy at your company. Weigh the costs of bringing an instructor to your office vs. attending a training program offsite.

Although some technically savvy administrators and employees adjust quite naturally to new software or hardware, others waste countless hours trying to learn the ins and outs of a new system. Corporate computer training puts everyone on the same page, teaching employees and administrators how to properly utilize the hardware and software that will help lead a business into the future. ●

by Jeff Dodd

For More Information:

Creative Computing Center Inc.
(212) 663-4760

New Horizons Computer Learning Center
(617) 229-9565

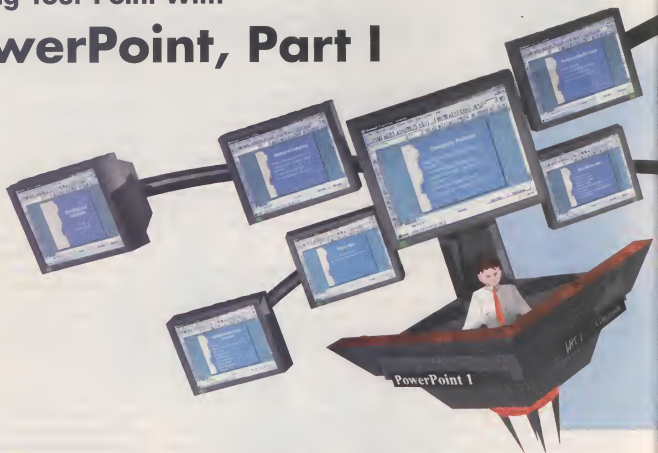
SteeleTech Consulting, Training, and Development
(219) 739-1044

The Training Edge
(510) 235-6401

Trillium Consulting
(206) 957-4649

Woodie Computer Associates (WCA)
(410) 974-0650

Making Your Point With PowerPoint, Part I



Many businesspeople look wistfully at their co-workers' (or competitors') professional-looking presentations, wishing they had the equipment and know-how to produce such impressive documents. Creating presentations that pack more punch isn't as hard as you think. You don't need a degree in statistics or art to put together an attractive, easy-to-read presentation. Presentation graphics software can help you get the job done quickly and easily.

Available by itself or as part of the *Microsoft Office* suite, *Microsoft PowerPoint* is one of the most popular presentation graphics programs. With templates for many common business-related topics and lots of help literally at your fingertips, almost any subject can be covered without a lot of hassle. The level of complexity is entirely up to you, the user.

PowerPoint can help you create several kinds of presentations. You can create black-and-white or color handouts, 35-millimeter slides, overhead transparencies, and on-screen presentations that you can display on your computer or a large screen. You can create documents with PowerPoint alone, or you can

use material from other sources such as *Microsoft Word* and *Excel*. You also can import graphic, sound, or video files to add pizzazz to your work. PowerPoint even will help you practice giving the presentation and do follow-up work with your audience.

In the first part of this series, we'll introduce you to *Microsoft PowerPoint for Windows 95 7.0* and take you through the basic steps necessary to create and deliver a simple presentation.

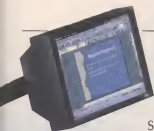
■ The PowerPoint Workspace

If you've ever worked with *Microsoft Publisher*, the workspace in PowerPoint will look familiar. There's a large work area where your slides will be displayed. (PowerPoint refers to each page of your presentation as a slide, regardless of what medium you use for your presentation.) The menu bar contains only two options, File and Help, until you open a document. (File menu options are New, Open, the names of the files you've worked with most recently, and Exit. Help contains PowerPoint Help Topics, the Answer Wizard, Tip Of The Day, and About PowerPoint.) Once you've opened a document, the menu bar also

includes an icon for your open document, Edit, View, Insert, Format, Tools, Draw, and Window. The icon for your document lets you size, move, or close the presentation window containing your document. We'll cover the editing and formatting options and tools as we come to them while we create a sample presentation.

There are two buttons across the top of the screen and one on the left side of the screen. The top toolbar, just under the menu bar, has many familiar buttons: New, Open, Save, Print, Spell Check, Cut, Copy, Paste, Copy Formatting, and Undo/Redo. There also are buttons to insert Microsoft Word tables, Excel worksheets, and Microsoft Graphs. This toolbar also contains buttons to insert clip art from the clip art library, insert a new slide, apply a design template, show or hide the Animation Effects toolbar, transfer the document's contents to Word, and display the document in black and white.

The second toolbar, below the first, displays the font name and its point size. It also contains buttons to increase and decrease the font size



and add text effects such as Bold, Italic, Underline, Shadow, and Text Color. This bar also includes alignment, paragraph spacing, bullet list, and indentation buttons.



The toolbar along the left side of the screen contains the tools you'll use to personalize the design of your presentations by adding details such as colors, shapes, and borders. We'll discuss these tools when we cover advanced editing and graphics in Part Two of this series.

You can alter your toolbars to meet your needs. You can move, delete, or add buttons to the toolbars by choosing Customize from the Tools menu. Select a button category. To add a button from that category to a toolbar, drag the button you choose to the toolbar you want it on. To remove a button from the toolbar and place it in a category, drag the button from the toolbar to the Buttons collection. You also can move the entire toolbar by dragging it with your mouse to a new location.

Basic Moves

When PowerPoint is opened, you can start a new presentation or open an existing one. If you want to create a new presentation, you have three choices: working with the AutoContent Wizard, using a template, or starting with a blank presentation. Left-click the button in front of the method you want to use, and left-click OK. (We'll cover each of these options in more detail later, as we create a sample document to be used for an employee orientation. You can use our steps as a guide for your own presentation or just use them to familiarize yourself with the program before starting a presentation of your own.)

If you want to open an existing presentation at the start of a PowerPoint session, left-click the button in front of Open An Existing Presentation, then left-click OK. In the File Open dialog box that appears, you either can find your file in a list or search for it by entering any of several criteria, including name, type of file, and the date it was last modified. When you've highlighted the file you want, left-click Open.

Documents are opened, closed, and saved the same way as in other Win95 applications. The File menu contains the familiar Windows Open, Save, Save As, and Close commands.

Changing Views

You can view your presentation in five formats. The default option is Slide View, in which you see one slide at a time and use arrow buttons to move among slides. Outline View lets you view all the text of your presentation in a standard outline format instead of slide by slide. Slide Sorter View displays miniature versions of all the slides; this is helpful when you want to change the order of the slides in your presentation. Notes Pages View lets you create speaker's notes for each slide. Slide Show displays your entire presentation as an on-screen slide show; left-click to move to the next slide. To choose a view, left-click the appropriate view button on the left side of the status bar at the bottom of your work area.

We found it easiest to work in Slide View when creating a simple presentation. The other views were better for specific tasks that we'll cover later.

Creating New Documents

As mentioned earlier, you can create a new template by using the AutoContent Wizard, a template, or a blank presentation.

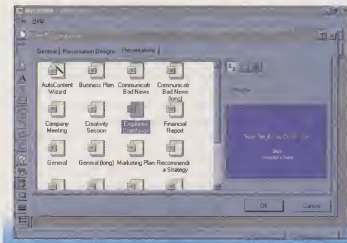
Using the AutoContent Wizard. PowerPoint has a Tip For New Users that says the AutoContent Wizard is the quickest way to create a presentation. If you're past the opening screen for PowerPoint and want to choose the AutoContent Wizard, go to the File menu, select New, left-click the Presentations tab, left-click the AutoContent Wizard, then

left-click OK. If you choose this option, read the introductory information about the wizard, then create a title slide. You'll be asked to enter your name, a topic, and any other information you want on the title slide. If you entered your name and business name when you installed the software, PowerPoint inserts your name and puts your company name in the last space, for additional information. To change anything or to add text in a blank line, left-click the box where you want to make the change and type your text. (For our sample presentation, we left the name and company name as they were, and entered "Employee Orientation" in the topic line.) After making your changes, left-click Next.

The next step is to choose your type of presentation. There are six choices and an Other button that takes you to a list of all templates in PowerPoint. (We had to use this option to find the Employee Orientation template.) Select the type you want and left-click Next.

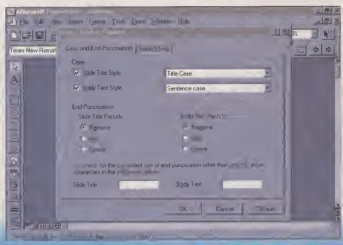
If you choose a template under Other, PowerPoint is now ready to finish assembling your presentation. Left-click Finish.

If you use a presentation type in the AutoContent Wizard other than a template, you'll need to perform a few more steps. (For this example, we entered "Employee Training" as our topic for our title slide and chose Training from the list of presentation types instead of using the Employee Orientation template.) First, choose a visual style for your presentation: professional, contemporary, or default. We chose default. You also choose a presentation length: 30 minutes or less, more than 30 minutes, or, for those of you who like flexibility, "Haven't Decided." (We chose Haven't Decided.) Left-click Next after making those choices.



You can preview a broad selection of templates before choosing one for your presentation.

The Style Checker lets you choose how you want certain elements to be handled as you edit your presentation.



The next step is to select a medium: black-and-white overheads, color overheads, an on-screen presentation, or 35-millimeter slides. You also choose whether to print handouts. (We chose to present an on-screen presentation, without handouts; these are the default options.) If you want to make a presentation with handouts alone or create a handout that will be given without an accompanying presentation from you, stick with the default option. You don't have to use the on-screen presentation if you choose not to. Left-click Next when you're ready to move on.

At this point, you've made all the elementary decisions. Left-click Finish, and PowerPoint will combine those elements to make a skeleton presentation. Now would be a good time for a coffee break, before you plunge into personalizing the presentation with your information.

Using a template. Using a template isn't much harder than using the AutoContent Wizard. After you choose the template option, a New Presentation window opens. There are three tabs: General, Presentation Designs, and Presentations. The General tab contains the blank presentation option. The Presentation Designs tab lets you choose a design style for your presentation. Options include Brown Marble, Contemporary, and Professional. When you left-click a style, a sample of the design will appear in the Preview window. For now, skip this step. If you left-click OK after choosing a style, you'll leave the New Presentation window and create your presentation one slide at a time, with the chosen style applied to each slide.

Left-click the Presentations tab to choose the template for your presentation. PowerPoint offers templates for the most common

presentation topics, including Employee Orientation, Financial Report, Selling A Product Or Idea, and Training. Again, when you left-click a template, the Preview window will display a sample of the presentation. After choosing a template, left-click OK. (We chose Employee Orientation.)

PowerPoint will display a skeleton presentation, with the outline of your topic arranged on slides. Use the arrow keys on the right side of the screen to move among slides in the presentation. PowerPoint has text on each page, suggesting material for you to cover at that point in the presentation.

To choose a design style for your presentation, choose Apply Design Template from the Format pull-down menu. The choices in the dialog box that appears are those offered on the Presentation Designs tab of the New Presentations window. Again, when you left-click a design, a sample appears in the window. When you find one you like, left-click Apply. Now, your presentation appears with your chosen design. You're ready to personalize the presentation.

Starting with a blank presentation. If you feel confident, you can start with a blank presentation and do all the work yourself. If you choose this option, you'll make one slide at a time. The New Slide dialog box will appear to help you create the first slide. If you want to make the slides in the order they will be presented, left-click OK to accept the title slide that AutoLayout has highlighted. The slide will be created with no design elements—not even a background color. There will be boxes with instructions such as “Click to add title.” Left-click each box to replace the instructions with your text. (In our example, we replaced the above message with the title “Employee

Orientation”, and the “Click to add subtitle” message with our company name). To create the next slide in your presentation, left-click the New Slide button at the bottom of your workspace, then choose the AutoLayout you want for the next slide.

To add a background to your blank presentation, choose Apply Design Template from the Format pull-down menu, select the style you want, and left-click Apply.

■ Inserting Your Material

To insert your own text in place of PowerPoint's suggestions, left-click the text to be replaced and type your own words. For example, on the title slide, if PowerPoint hasn't inserted the correct information, you'll want to replace PowerPoint's labels (Date and Presenter's Name) with the presentation date and your name.

There might be some parts of the presentation that you can leave as they are. For example, the second slide in our Employee Orientation presentation was a list of topics to be covered, such as Company Policies, Benefits Review, and Required Paperwork. Because we wanted to include all of the listed topics in our presentation, we didn't need to change anything on this slide. However, we could have removed or changed an item by left-clicking it and then pressing DELETE or typing in new text.

Now that you've created your presentation, you will want to polish it, making sure it's the best it can be. PowerPoint includes several tools to help you edit the presentation you created.

In addition to the traditional Spelling command that checks for misspellings, the Tool menu offers AutoCorrect and Style Checker.

AutoCorrect, seen in other Windows applications such as Word, is a tool that corrects typographical and spelling errors. It also lets you abbreviate common terms and expand them instead of typing the entire term each time you need it in your presentation.

The Style Checker, which checks for style inconsistencies in your presentation, lets you decide whether you want to check for Spelling, Visual Clarity, Case And End Punctuation, or a combination of these elements. The Options button in the Style Checker window lets you specify how you want certain things done. For example, you can tell Style Checker to remove periods in your slide titles or to check for consistent use of punctuation marks other than

periods. When you've selected what you want checked, left-click Start.

■ Printing

PowerPoint offers several printing options. In this article, we'll just show you the basics, demonstrating how to print a presentation with one slide on each page. The advanced options, such as printing outlines, overhead transparencies, or 35-millimeter slides, will be covered later in this series.

To print a presentation, open it, and select Print from the File menu. This will open the Print dialog box. Make sure the information displayed about your printer is correct. Under Print Range, you can choose which pages you want to print by left-clicking All, Current Slide, or Slides. If you choose Slides, you must enter the slide numbers you want printed. For this option, leave the Print What set on Slides. You can choose to print the slides in black and white, to frame them, or to scale the slides to fit the paper you're printing on. You also choose how many copies you want printed. When you've made these decisions, left-click OK.

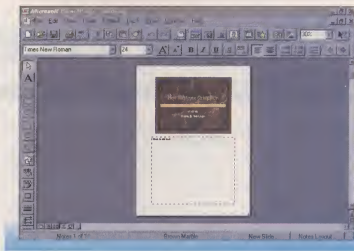
■ Giving A Simple Presentation

PowerPoint doesn't just help you create the presentation and then leave you stranded. Several tools in the program help you rehearse and give the presentation. We'll cover the most basic ones here and go into more detail later in this series.

For this article, we'll assume that your presentation is an electronic slide show where you will display the slides you created on a computer monitor or project the image from your computer onto a large screen using an LCD panel.

The first step will be to print the slides if you want to give copies to your audience so it can follow along and have material to review on its own. Follow the steps outlined above for printing simple one-slide-per-page handouts.

Next, you need to prepare for the actual presentation. PowerPoint offers several preparation aids. One of the most helpful options is creating speaker's notes for yourself. These notes will contain material for your audience not included on their handouts. To create a set of notes for yourself, left-click the Notes Pages View button at the bottom of your workspace. In this view, each page has a miniaturized view of a slide and a blank area



The Notes Pages View lets you create speaker's notes for each slide in your presentation.

for you to write notes about that slide. (You'll need to enlarge the notes area using the Zoom control drop-down list on the top toolbar. In full-page view, the notes area is too small to read.) To add your notes, left-click in the Notes Pages area, and type your text. When you're done, choose Print from the File menu, and choose which pages to print. Left-click OK to print.

We will cover some of PowerPoint's more advanced preparation tools later in this series.

■ Getting Some Help

PowerPoint offers several places for you to turn if you get stuck while working on a presentation. You can learn about PowerPoint screen features at the far right end of the top toolbar. Left-click the button, then left-click the item about which you have a question. You'll see a brief description of the item.

The Help menu offers two types of help: Microsoft PowerPoint Help Topics and the Answer Wizard. The Help Topics window has four sections; left-click the appropriate tab to use that help feature. The first is Contents, which lists major topics about PowerPoint. To see more about a topic, left-click the book icon next to it and left-click OK. (You also can double left-click the book icon. A list of subtopics will be displayed; double left-click the option you want for detailed information on that topic.)

The second Help Topics option, Index, lets you enter the first few letters of the word you're looking for and displays the topics that match what you typed. When you find the topic that interests you, double left-click that topic to see help about the topic.

The third option is Find. The first time you use the Find option, you'll need to use the Find Setup Wizard, which is opened when you initially use this option. The Wizard will create a database of the words in all help files. You can make the database the minimum size, maximum size, or a custom size. The suggested option is Minimize Database Size. Left-click Next when you've chosen the option you want, then left-click Finish to create the word list. Once you've established the word list, Find will offer a window like that in the Index option. Type the word or words you want to search for, select matching words to narrow your search, and finally, left-click the topic and then left-click Display to read the available information.

The final option in the Help Topics window is the Answer Wizard, which you also can access from the Help menu. Type your question in the line provided and left-click Search. PowerPoint will list topics related to your question. Double left-click the one you want to read.

Next month, we'll show you how to use some of PowerPoint's more advanced features, such as importing text, adding graphics, and using PowerPoint with other applications. ●

by Diana K. McLean

For More Information:

Microsoft PowerPoint for Windows 95 7.0
Microsoft Corp.
\$339 (retail); \$129 (upgrade)
(800) 426-9400
(206) 882-8080

Word Pro 96

Using Find & Replace



ost people use find-and-replace tools to locate words they want to change. However, you can do much more in Word Pro, such as change a word's font, color, or attribute; delete double

returns; and find where certain words or characters are used in a document. To activate Find & Replace, place your cursor where you want the search to begin and choose the Edit menu's Find & Replace Text command, or press CTRL-F. This brings up the Find & Replace review bar, where you tell Word Pro to find text or replace it with certain text attributes and properties, specify the direction of the search, and use special characters to guide the search. Now type the text you want to find in the Find field, then type the text you want to have it replaced with in the Replace With field. If you want the text deleted, make sure the Replace With field is clear.

Word Pro flags the text even if it is a subset of another word. For example, if you're searching for the word "men," Word Pro will flag "menagerie," "mend," and "menial" as well. To speed your search, you may want to narrow it by including only complete words; to do this, select Whole Words Only from the drop-down list in the Find & Replace list box.

The arrows to the right of the Find button tell Word Pro the direction in which you want to search the document. If you want to search forward, choose the right arrow.

You're now ready to search for your text. Left-click Find to make Word Pro search for each occurrence of the word, highlighting it in the text when it is located. To replace a highlighted word, left-click

Replace. If you know you want to replace every use of the word, left-click Replace All.

When Word has finished searching, left-click Done to remove the review bar from your screen.

If you want to increase the power of this feature, use the available options to alter your search. By choosing Options on the review bar, you open the Find & Replace Text Options dialog box. In this box, you can change the scope of the search and tell Word Pro to search for and replace with certain text attributes.

By changing defaults in the Find & Replace Scope section, you can tell Word Pro to search only the current division of your document, rather than the whole thing. You also can direct it to check headers and footers, tables, frames, footnotes, or main document text rather than all text.

■ Setting Properties

Find & Replace also can quickly change a text attribute such as boldface, underline, or color to another attribute or color, no matter where or how many times it appears in the

document. You tell Word Pro to do this with the Find Options and Replace Options sections of the Options dialog box.

To tell Word Pro to look for text with certain attributes, place an X in the box to the left of the Include Properties option. Then left-click the button to its right (the one with the *a* and *z* on it). The Find & Replace Text Properties box pops on-screen. In the Find tab of this box, you choose text properties such as font, size, attribute, and color that you want Word Pro to locate. To change these properties, follow the same procedure with the Replace Options section of the Options box, choosing the properties you want the text to have in the Replace With tab.

Occasionally, you may need to locate certain characters such as spaces, specific words and phrases, or double returns. For example, if you want to delete a blank line between paragraphs, you would insert the special characters ^r^r in the Find field of the review bar and ^r in the Replace With field. (The table on this page lists commonly used special characters, what they find or replace, and how they may be used. For a complete listing, access the drop-down list at the bottom of the Options dialog box, located in the Special Characters Help section.)

The next time you spell something wrong, decide not to remove blank lines between paragraphs, or want to make every use of the word "Warning" in your document appear in red, don't forget Word Pro's Find & Replace features. They're there to slash the time these tasks take. ●

by J. L. Johnson

Special Characters	Finds /Replaces	Possible Uses
^r^r	Two returns	When used with ^r^r in the Find field and ^r in the Replace With field, this can delete extra lines between paragraphs.
^t	Tabs	By typing five spaces in the Find field and ^t in the Replace With field, you can replace spaces at the beginning of paragraphs (or anywhere) with a tab.
^?	Any character or group of characters in a word	Finds words with certain characters. To find words that start with <i>d</i> and end with <i>ing</i> , you'd type <i>d^?ing</i> in the Find field. Word Pro would locate all such words, including <i>drowning</i> , <i>durang</i> , and <i>drooling</i> .
^<	Characters to the following word or the end of the document	Finds every combination of words between specific beginning and ending ones. Suppose you're looking for the sentence <i>The slow, lazy dog is taking a nap</i> , but you only remember that it starts with <i>The slow</i> and ends with <i>nap</i> . Type <i>The Slow^<nap</i> in the Find field to find every combination of words between <i>The slow</i> and <i>nap</i> .
^>	Characters to the end of the word	Finds all words with text before or after this character or group of characters. For example, to find words beginning with <i>elect</i> , you'd type <i>elect^></i> in the Find field. Word Pro would return words such as <i>elects</i> , <i>election</i> , and <i>electrifying</i> .
^p	Text and everything that follows it in a paragraph	Finds all text following specific text within a paragraph. For example, if you want to find the paragraph that begins with <i>The following</i> are examples of, you'd type <i>The following</i> are examples of ^p in the Find field.

Microsoft Excel 5.0

Using Sheet & Workbook Autotemplates



If you don't like the format of *Microsoft Excel's* default sheets and workbooks, take heart. Microsoft lets you create alternate templates for them. These useful tools are called autotemplates.

By placing sheet and workbook autotemplates in Excel's startup or alternate startup directory, you can use them as the basis for all the new workbooks you create and all sheets you insert. Like other templates, autotemplates can contain formatting codes, graphics, formulas, and macros. Basically, an autotemplate is like any other Excel template, except that it is saved with a special name and in a specific directory.

When you begin Excel, the program checks the contents of its startup directory. This directory is the XLSTART directory, located in the C:\EXCEL directory (or whatever name you specified upon installation).

When Excel checks the startup directory, it does two things. First, it opens all workbook files found there, so if you always use a particular workbook, save it in this directory, and it will automatically open for you. Second, it stores autotemplates for use when creating new workbooks and sheets.

After exploring the startup directory, Excel looks to the alternate startup directory, if you specified one, for additional files and autotemplates. For example, if you share templates with other users on a network drive, they will be stored in an alternate startup directory to which all of you have access.

NOTE: If you don't have an alternate startup directory, you can create only one. To do so, select Options from the Tools menu to open the Options dialog box. Select the General tab, then specify the alternate directory in the Alternate Startup File Location box.

You can have more than one autotemplate for new workbooks. When you do, a New dialog box appears (when you click the New Workbook button or select New from the File menu), asking you to choose the name of the autotemplate you want to use.

■ Creating Default Workbooks

Create or open the workbook that has the formatting, data, formulas, and macros you want in the new workbooks you open. To save the workbook as a template:

1. Choose Save As from the File menu.
2. Select Template in the Save File As Type box in the Save As dialog box.
3. Change the directory in the Directories box to the XLSTART or the alternate startup directory.
4. Enter the name Book.xlt in the File Name box.
4. Click OK.

The next time you select the New Workbook icon on the toolbar or choose New from the File menu, the new workbook Excel creates will look like this one.

NOTE: If you want another workbook autotemplate, change the name to Book2.xlt, Book3.xlt, and so forth. Then you'll be greeted with the New dialog box, where you choose the desired autotemplate.

■ Making Default Sheets

You save sheet autotemplates in a similar fashion. Create or open a workbook you want to use as a sheet template—making sure it has only one sheet. Choose Save As from the File menu. Select XLSTART or the alternate startup in the Directories box, choose Template in the Save File As Type box, and type the correct sheet name in the File Name box. To determine which name to use for worksheets, charts, or dialogs, consult the chart at the bottom of this page. When you've finished naming your file, click OK.

■ Inserting Sheets With Autotemplates

You use autotemplates to insert each sheet type differently. To insert a worksheet, choose the Insert menu's Worksheet command. To insert a chart, choose Chart from the Insert menu; in the resulting submenu, choose As New Sheet. For a dialog sheet, select Macro from the Insert menu, then choose Dialog from the submenu.

Autotemplates are big timesavers for users who consistently change the default workbook and sheet settings in Excel. With autotemplates, the process becomes automatic. ●

by L. Johnson

It's All In The Name

Here's a quick look at the autotemplate types and how to use them:

Autotemplate	Type Name	Using The Autotemplate
Workbook	Book.xlt	Select New from the File menu or click the New Workbook button on the toolbar.
Worksheet	Sheet.xlt	Choose Worksheet from the Insert menu.
Chart sheet	Chart.xlt	Select Chart from the Insert menu, then choose As New Sheet.
Dialog	Dialog.xlt	Choose Macro from the Insert menu. Then select Dialog from the Macro submenu.

Microsoft Word 6.0

Error-free Typing With AutoCorrect & AutoText



hile all word processors have built-in spell checkers, *Microsoft Word 6.0* goes one step further with AutoCorrect, a proofreading enhancement that corrects common spelling and typing errors. For example, if you type "don't," because you inadvertently pressed the semicolon key instead of the apostrophe, AutoCorrect automatically inserts "don't." Similarly, if you type "i" by itself, Word changes it to "I" because it assumes that you meant to type the pronoun "I."

AutoCorrect's initial vocabulary list contains only eight word pairs, but it's easy to add new ones.

1. From the Tools menu, choose AutoCorrect.
2. Make sure the Replace Text As You Type box is marked with an X.
3. In the Replace field, enter a common spelling error (e.g., *veiw*).
4. Press the TAB key to move the cursor to the With field and type *view*.
5. Click Add. Word adds the new word pair to the AutoCorrect list. Now, whenever you type "veiw," Word will automatically substitute the word "view." You also can add words to the AutoCorrect vocabulary list while you're performing a spell check by using the AutoCorrect button in the Spelling dialog box.

AutoCorrect also can be outfitted with a list of typing shortcuts that can save time and reduce errors. For example, add your name or company name to the AutoCorrect list (i.e., have it substitute "John Smith" for "JS"). Similarly, configure it to replace "cuz" with "because," "asap" with "as soon as possible," or your name, postal address, phone number, and E-mail address for two or three characters.

Whenever you add new words to AutoCorrect, Word lists them

alphabetically, making them easy to locate, edit, or delete. If you're working in a document and come across text you'd like to add to the list, highlight that text, then choose AutoCorrect. This directs the AutoCorrect dialog box to appear with highlighted text already positioned in the With field and the cursor in the Replace field, ready for you to enter the text you want to replace. You decide whether to save the characters entered in the With field as plain text or formatted as they currently appear in your document.

AutoCorrect offers several additional options. For example, you can have it change Straight Quotes to Smart Quotes, which substitutes curled typographic quotation marks and apostrophes for straight-edge typewriter marks. Similarly, you could direct AutoCorrect to fix Two Initial Capitals. AutoCorrect also can be customized to capitalize the first letter in a sentence or the first letter in Monday, Tuesday, Wednesday, and so forth.

■ AutoText

If you want to replace a few typed-in characters with paragraphs of formatted text (or a combination of text and graphics), consider AutoText. This command (known as Glossary in earlier Word releases) appears as a

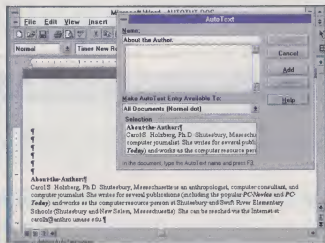
grayed-out Edit menu option unless you select specific text or graphics in your document, or you have existing AutoText entries.

To create an AutoText entry:

1. Highlight the text (or text with graphics) you want to store in the AutoText glossary. If you're working with text, Word recommends leaving a space at the end of the phrase or paragraph so that the blank space entered after a word is already there.
2. Click the Standard toolbar's AutoText button (the one with an index finger pointing at a keyboard) or choose AutoText from the Edit menu.
3. In the resulting AutoText dialog box, accept Word's default name for the new entry or enter a different name (maximum 32 characters, including spaces).
4. Specify the location where this AutoText entry should be saved. By default, Word stores it in the Normal.dot template, making it available to all Word documents.
5. Click Add to create an entry. To ensure that Word stores this entry with line spacing, indentations, and other formatting intact, include a paragraph symbol (¶) at the end of the selection. Clicking the paragraph mark button on the Standard toolbar will reveal the whereabouts of each paragraph mark in the document.

To insert an AutoText entry, position the cursor where you want the text to appear. The insertion point should be at the beginning of a line or flanked by spaces. Then, type the name of the AutoText entry and press F3. Alternatively, choose AutoText from the Edit menu, then click the entry you'd like to insert, specifying plain or formatted text. ●

by Carol S. Holzberg, Ph.D.



The AutoText command lets you store frequently used text in a glossary for instant recall at a later time.

WordPerfect 6.0

Text Styles, Part 2



WORD
PROCESSING

ext styles are a time-saver if you don't want to enter formatting codes each time you need a document to look a certain way. A set of predefined system styles comes with *WordPerfect*, and you can create other styles to store in personal or shared libraries.

Last month, we described the creation and application of text styles. Other options let you edit and delete styles, copy styles between libraries, and control what happens when formatting codes are turned on and off.

■ Style Off Codes

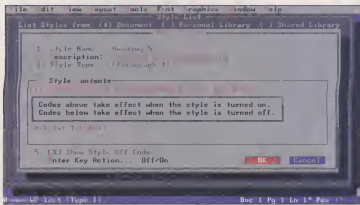
When styles are created, style on and off codes and their specific formatting codes are inserted into your document and can be viewed in Reveal Codes mode. A style is created by blocking text or positioning the cursor within a paragraph. Choose Style from the Layout menu or press ALT-F8 to display the Style List dialog box. Click Create to display the Create Style dialog box, type in a name, select a style type, and choose OK to advance to the Edit Style screen. Your formatting codes are entered into the Style Contents box.

Option 5/Show Style Off Codes splits the Style Contents box in half. Codes entered above the marker will take effect when the style is turned on; the codes entered below the marker take effect when the style is turned off. This control over formatting means you don't have to repeat several steps to define a new style when one is turned off in your document.

■ Assigning ENTER Key Actions

The ENTER key can do more than just advance to another paragraph. An option on the Edit Style screen lets you define what the ENTER key does within a paragraph or character style. This is another timesaver that allows actions such as automatically turning another style on when one is turned off.

When you select 6/Enter Key Action, you have four choices:



- **Enter A Hard Return:** The ENTER key functions as it normally does, inserting a hard return but leaving the style turned on.
- **Turn Style Off:** The ENTER key moves past the style end code (useful for headings and titles).
- **Turn Style Off And Back On:** ENTER moves past the style end code and then turns the style back on (useful for bullet lists and paragraphs in which the first line is indented).
- **Turn Style Off And Link To:** ENTER moves the cursor past the Style Off code and then turns on another style that you specify.

■ Editing & Deleting Styles

Text styles can be edited to change formatting codes, or they can be deleted when no longer used.

To edit a style, press ALT-F8 to display the Style List dialog box. Highlight the style to edit, choose 3/Edit, and make your changes on the Edit Style screen. Formatting codes are deleted by placing the cursor on them and pressing DELETE. Insert new codes by placing the cursor at the insertion point and entering the codes. The changes will affect all the text using that style within your document.

To delete a style, press ALT-F8, then highlight the style to delete and choose 4/Delete. You will be prompted to select either Including Codes or Leaving Codes. The Including Codes option deletes all occurrences of the style from the document and removes the formatting codes from the affected text. Leaving Codes deletes all occurrences of the

Options within WordPerfect let you create styles and control their functions.

style but leaves the formatting codes in effect. Both options remove the style from your style library.

■ Other Options

You can copy styles to other libraries. On the Style List screen, highlight the style to copy or use 9/Mark to mark several styles and select 5/Copy. You can copy the style(s) to the same document (under a different name), your personal library, or a shared library. To unmark styles before copying, highlight them and select 9/Mark.

To list the system styles (see last month's Quick Study) along with the styles you have created, select 6/Options. Then mark List System Files and press ENTER to list the system files in the Style List dialog box.

To save the current document styles as a style library that can be retrieved into other documents, select 7/Save. Type in a name for the library and press ENTER.

To retrieve a personal library into a document, select 8/Retrieve and specify the library to retrieve. The library's styles will be listed in the Style List dialog box.

The Name Search option searches through a list of styles to quickly move the cursor to the one you want. Press N and type in the name of the style you are searching for.

These options within the Text Style feature let you create your own efficient methods of applying different styles to your documents. Next time, do it with style. ●

by Diane Kaye Walkowiak

Quattro Pro 6.0

Increasing Efficiency With Experts



6.0 FOR WIN

SPREADSHEETS

here's no need to spend months learning to become an expert in many of the common uses for *Quattro Pro* 6.0. The program offers a feature set called Experts that guide you through the prime uses for spreadsheets.

An Expert walks you through an elaborate process, asking key questions along the way. Through this "interactive" approach, an Expert can help you create highly customized notebooks for a variety of uses. *Quattro Pro* offers eight general categories of Experts—Graphing, Scenarios, Consolidation (statistics), What-If analysis, Performance Analysis, Budgeting, and Slide Shows—that offer subsets of tools. To exemplify how well Experts can work for you, we'll go through the process of creating a home budget.

■ Building The Perfect Beast

To start any Expert, click the Expert button on the toolbar (the one with the light bulb).

Next, select an Expert; for our tutorial, click Budget Expert.

Step 1: *Quattro Pro* makes two kinds of home budgets and three kinds of business budgets. Select Home—Actual from the Budget Tool list, then click Next Step to continue.

Step 2: Now we'll tell the Expert what kind of income puts money in your pocket. If your income source isn't listed, enter a name for it in the New Item field, then click Add to place the income source on the list. When you're done, click Next Step.

Step 3: Using the provided list of the most commonly used expense categories, start entering the ones applicable to your budget. If you have any that aren't on the list, enter their names, clicking Add to insert each one. Click Next Step when you're finished.

Step 4: Budget Expert asks whether you want a monthly, quarterly, or annual budget. If you want to enter information monthly, you'll get the most accurate budget if you choose that option. Set the starting period and the time span of your budget, then click Next Step.

Step 5: Now choose how you want your spending summarized. The options are Quarter-To-Date and Year-To-Date. Choose the latter if you want to see how much you spend over the course of the budget period. If you're satisfied with seeing how much you spend in three-month subtotals, choose this option. (You can select both options.) Click Next Step.

Step 6: Give your budget a title and subtitle in the fields provided, and click Next Step.

Step 7: Tell *Quattro Pro* to either place the budget in the current notebook or in a new one. If you select current notebook, you can specify a block of cells into which the budget will be inserted; the budget will start in the upper leftmost cell in the range. If you choose new notebook, the budget will start in cell A1 on the first page of the notebook.

Step 8: Here, you decide how you want your budget to appear when it's completed. If you'll be viewing your budget on black-and-white printouts, select the Laser Printer option. If you have a color printer or will only be

working on-screen, click Color. The Page Break options let you designate whether there will be page breaks or if the budget will be split by month, quarter, or year. Click Build Budget, then wait while *Quattro Pro* generates your new household budget. All that's left to do is to enter your data in the appropriate cells.

Quattro Pro helps you get your finances in order—even when you're unsure how to go about it. Beginner, intermediate, and expert users alike find the Experts to be real lifesavers when time is short and results are required. As you become more proficient with the program, you'll find there's plenty of room for personal growth, even for the "experts." ●

by Robert Mullen

Expert	Options	What It Does	Example Of A Popular Use
Graph		Helps you build a graph or chart using numbers in your worksheet	
Bar		Presented as vertical bars, compares highs and lows in data over a given time period	Sales each month, over a number of months
Rotated Bar		Presented as horizontal bars, compares highs and lows in data over a given time period	Sales each month, over a number of months
Pie		Shows the value of each kind of data as part of a whole	Categories of sales as a percentage of all sales
Line or Area		Depicts relationship of changing values over a timeline	Tracking changing income or expenses over a period of time
Specialty		Creates Radar, Scatter, and Plot graphs	Depicts changes in trends
Expert's Choice		Chooses the type of graph that best suits your needs	
Budget	Home: Actual	Categorizes expenses and income over a timeline	Makes your first home budget
	Home: Actual-to-plan	Reports on how well you followed your home budget	Maximizing success of home finances
	Business: Actual	Creates a small business budget	Helps you keep expenses in line
	Business: Actual-to-plan	Indicates how well your business is performing compared to planned operations	Reports on how well you stayed within your expense ceilings
	Business: Income Statement	Depicts all income (in categories) for a business	Creates an income statement for use in securing financing

A breakdown of the most commonly used Experts for home and business budgets.

PageMaker 5.0

Scaling & Cropping Graphics

5.0 FOR WIN



After learning how to rotate, reflect, and skew objects using the Control Palette, you're probably wondering how you can use the moving, scaling, and cropping tools to your advantage. When you use these options, you don't have to use the arrow or cropping tools or press the SHIFT key to proportionately resize objects or move them in a straight line.

■ Moving Objects

You move an object by selecting and dragging it anywhere on-screen. When you do this, the only way to know whether that line across the page is exactly 2.5 inches from the top is with the on-screen rulers. But what if that line has to be .315 inches below the baseline of the longest text block in a three-column layout? With rulers, the best thing you can make is an estimate. But with the Control Palette, the estimate becomes an exact value.

Remember that an object's position on-screen relates to the rulers' zero points. Also, the values in the Control Palette's X and Y boxes are based on the reference point shown by the Proxy (see last month's Quick Study). So before you move an object, make sure you've set the rulers' zero points and chosen a reference point on the Proxy. The values you can change depend upon the selected reference point and are in bold type in the Palette.

To move an object, select and enter values for X and Y. The X coordinate shows the

distance between the object's reference point and the horizontal ruler's zero point, while Y is the distance between the object's reference point and the vertical ruler's zero point. After entering values, press ENTER, or click the Apply button.

You also can use the nudge buttons at the left of the X and Y boxes to move objects .01 inch at a time. Press the CTRL key while clicking a nudge button to move an object .1 inch, or 10 times the nudge value.

■ Resizing Objects

You can resize an object by dragging one of its handles, pressing the SHIFT key as you drag (to scale proportionately), or through the nudge buttons at the left of the W (width) and H (height) in the Control Palette. The nudge buttons resize objects 0.4% at a time or 3.9% if you use the CTRL key; they are useful if the object has to be scaled by only a few percentage points. To scale in large amounts more quickly, use the Scaling option in the Control Palette. Select the object and a reference point, and make sure the Scaling option is on. If not, click it to activate it.

The W and H settings each have two boxes. Those on the left show the object's actual measurements, which don't change regardless of the reference point. The measurements change only after you enter new values for the actual measurements or percentage change of scaling, shown by the rightmost boxes.

To resize an object proportionately, use Proportional Scaling. That way, if you change the width's measurement, simply press ENTER or click the Apply button. PageMaker automatically enters a proportionate measurement

value for the height and the same percentage change values to the width and height. If you change one of the height's values, the width's values automatically change. If Proportional Scaling is off, only the values for the height or width change.

■ Cropping Graphics

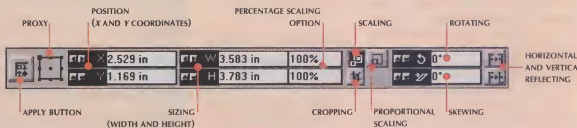
Like rotations, cropping can be done either with the cropping tool in the toolbox or the Cropping option in the Control Palette. (If you select Control Palette's Cropping option, the cropping tool in the toolbox is highlighted. This is especially convenient when you are working mainly through the Control Palette and prefer to crop a graphic manually.) To crop manually, select the cropping tool, then the graphic. Place the cropping tool on top of a handle (making sure the graphic's handle shows through the cropping tool), and drag the tool until it reaches the desired size.

If you are satisfied with the size of the cropped graphic but not the part of the graphic showing in the frame, place the cropping tool on the graphic. The tool turns into a grabber hand. Hold down the left mouse button until what you see in the frame is the part of the graphic you want to show.

To crop with the Control Palette, select the graphic and a reference point in the Proxy. Then change the width and/or height value(s). Again, the parts of the graphic that remain depend upon the reference point and the values you entered for the graphic's width and height. ●

by Annetney P. Dakay

The Control Palette lets you move, scale, and crop objects without making you use the tools in the toolbox.



Quicken Deluxe 5.0

Managing Multiple Accounts



How much money do you have? This question often prompts a quick search of pockets, purses, and billfolds for a stray \$5 bill or some loose change. Your crumpled pile of cash on-hand, though, is only a small portion of your total financial picture.

How much money do you *really* have? Considering the large number of sources for finances the average person now uses, remembering all of the accounts—let alone the balances—is a colossal struggle. Juggling checking, savings, credit card, and investment accounts along with home and auto loans and, of course, that all-important cash on-hand doesn't necessarily require an accountant's degree. With *Quicken Deluxe 5.0*, you not only can track all of your accounts, you can view and manage their frequent interactions.

Account Types

Quicken lets you create a variety of accounts to meet your needs. The available accounts are: checking, savings, credit card, cash (for a petty cash account), money market, investment (for stocks, bonds, and mutual funds), asset (for items you own, such as a home or accounts receivable), and liability (for money you owe, such as mortgage or auto loans).

Creating each type of account is fairly easy, thanks to Quicken's step-by-step account wizards. To create an account, click the Account List icon in your Quicken HomeBase window. Then click New to enter the Create New Account window in which you can choose from the aforementioned account types. Each type of account follows a similar step-by-step procedure and requires two to five minutes to create. Be sure to have your latest account statement available when you create the account.

When creating asset accounts, you either can lump all your assets into one account, or you can create separate accounts for each one. You also can create a single liability

account for all your loans or use separate accounts for each loan. We recommend using separate accounts for each asset or liability because it will be far less confusing for you in the future, especially since you probably will work with these accounts infrequently. (Be sure to give each account a unique, easy-to-understand name.)

Each account you create will have a separate entry in the Accounts List window. You can create up to 255 accounts. Your overall financial balance is displayed at the bottom of the Accounts List window. Double-clicking any entry in the Accounts List window takes you to the Register window for that account, letting you enter transactions.

After creating each account, we recommend entering additional information concerning the account. In the Accounts List window, click once on the entry for the account to highlight it, and then click Info. You now can enter the account number and information about the financial institution where the account is located. If you ever have a problem with an account, having such information easily available will be helpful.

Working Together

In Quicken, each account contains a unique balance, but all accounts you've created work together as well. For instance, if you transfer money from a savings account to your checking account, you enter the transactions in one account register, and Quicken will make the necessary changes to the other affected account.

When working in your account's register window, click Transfer. In the Transfer Funds window, enter the

amount of the transfer and the account that will receive the money. Then click OK. Quicken will make the necessary changes in both accounts.

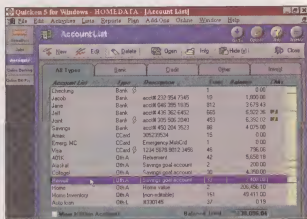
Creating savings goals for vacations or large-ticket purchases lets you use Quicken's accounts in tandem as well. Open the Plan menu, and choose Savings Goals. In the Savings Goals window, click New. Enter the name of the goal (give the goal a name that is different from your other accounts). Now enter the goal amount and the date by which you want to reach the goal, and click OK.

To make a contribution to the goal, click the goal's name in the Savings Goal window and click Contribute. In the Contribute To Goal window, select the account from which you want the money to come (usually a savings account) and the amount you want to contribute (Quicken will calculate a monthly contribution), and click OK. You'll see your progress in a bar graph.

Now look at the account from which you contributed to the savings goal. Your account balance will show the changes as if the savings goal were contained in a separate savings account and you transferred the money. You can click the Hide Savings Goal box at the bottom of the window to see the actual balance in the account. ●

by Kyle Schurman

The Accounts List window provides an at-a-glance view of the accounts in a file, how much money is in each account, and the combined balance of everything in a file.



Lotus 1-2-3 4.0

Looping Macros



macro is a set of instructions that performs a Lotus 1-2-3 task automatically when you run the macro. Macros range from very simple to quite complex, but their purpose is the same—to save time and keystrokes.

A **looping macro** is one that loops back on itself and repeats a series of keystrokes; it's activated by just a couple of manual keystrokes. Suppose, for example, that you have a column of entries you need to modify. Perhaps it is a list of part numbers that all need to have the letter G inserted in front, or maybe you want to round a series of numbers. Rather than changing each entry one at a time, you can run a macro that quickly moves through the range of entries, automatically modifying each one until it reaches the last entry, whereupon it returns to the top of the column.

Such a macro can be combined with an `{if}` command, which compares two elements or states. If the statement of comparison is true, then one thing happens, otherwise, something else happens.

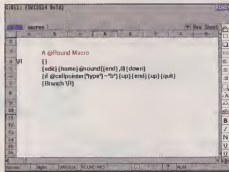
To check whether the current cell is blank or contains a label or value, the `{if}` command is used with the string `@cellpointer("type")`. The syntax arguments for these tests read as follows:

```
{if @cellpointer("type")="b"}
The {if} condition is true if the current cell is blank.
```

```
{if @cellpointer("type")="l"}
The {if} condition is true if the current cell is a label.
```

```
{if @cellpointer("type")="v"}
The {if} condition is true if the current cell is a value.
```

In our following example of an `@ROUND` macro, the `{if}` command checks for a blank cell. This allows the looping macro to stop when the cell pointer reaches a blank cell at the end of a column.



Activated by a few keys, this simple looping macro quickly executes repetitive keystrokes and saves you time.

■ Looping A ROUND

Rounding numbers can be done by inserting the `@ROUND` function in a formula affecting a cell or by highlighting and formatting cells to a certain number of decimal places. If you have a lengthy column of numbers to round, however, you can accomplish this chore with a looping macro.

The first step is to enter the macro name in a blank cell. Enter `\R` and press the Right arrow key to move to the cell immediately to the right of the name. Enter the following commands on separate but adjoining rows (consult graphic on this page to see how the macro should appear in your spreadsheet):

```
{
}{edit}{home}@round(end,0){down}
{if @cellpointer("type")="b"}{up}{end}
{up}{quit}
{Branch \R}
```

Position your cursor on the cell containing the macro name. Open the Range menu and select Name; in the resulting menu, choose Labels, then Right, and press ENTER. You can enter a description of the macro above the commands so you know what the macro does.

This macro switches to Edit mode, moves to the front of the entry, types `@ROUND` and an opening parenthesis, moves to the end of the entry where it types a comma and a zero, and then closes the parenthesis. The macro then

loops back to the beginning of its "program" and works on the next cell down and continues until it reaches a blank cell or until you press CTRL-BREAK to stop it.

To run the macro, position your cursor in the first cell of a column of entries and press ALT-R. The macro will round the numbers and return to the top of the column when it encounters a blank cell or a halt command from you.

You can modify this macro to round differently by changing the zero in the second command line to another number. A zero rounds the number 354.67 to 354. If the command line read `{edit}{home}@round(end,1){down}` instead, the number 354.67 would be rounded to 354.7.

■ An Indent Macro

Looping macros can be used for a variety of cell formatting functions. Another example is a macro that edits cells in a column to indent entries by four spaces. This macro also tests for a blank cell to determine when to quit.

For the cell name, enter `\I` and press the Right arrow key. For the macro commands, enter:

```
{
}{edit}{home}{right} {down}
{if @cellpointer("type")="b"}{up}{end}{up}
{quit}
{Branch \I}
```

This macro is run by pressing ALT-I. It will switch to Edit mode and insert four spaces in front of the label. The `{down}` command enters the change and moves the cell pointer down one cell. If the cell is blank, the cell pointer moves to the top of the column, and the macro quits; otherwise, the macro loops back to the beginning and formats the current cell.

More complex looping macros can be created, but the basic concept is the same as these examples, so get into the loop! ●

by Diane Kaye Walkowiak

How To Build A PC, Part II



j. cOdr

Last month, we looked at why users might decide to build their own PCs. We explained that experienced computer users with plenty of self-confidence (and a few hardware upgrades under the belt) could build a good, highly upgradable, repairable machine for about the same amount of money they would spend on a comparable system from a big manufacturer.

We also pointed out that one of the best things about building your own computer is that you have complete control of what goes inside it. When you buy a machine off the shelf, you sometimes end up paying for equipment and software you really don't need. When you build your own, if you don't want a 28.8 kilobits per second (Kbps) modem, you don't buy one. If you're happy with your old diskette drive, you can use it again in your new computer.

In the first story, we described the components we picked for our custom machine. We started from scratch, so all of our parts are new. Our list included the following components:

- An Intel 100 megahertz (MHz) Pentium CPU with cooling fan

- A Triton-based PCI motherboard with a 256 kilobyte (KB) pipeline cache
- Two Texas Instruments eight megabyte (MB) single in-line memory modules (SIMMs) of random-access memory (RAM) for a total of 16MB
- A Western Digital Caviar 21200 hard drive with 1.2 gigabytes (GB) of storage space
- A Mitsumi 1.44MB diskette drive
- A Samtron SC-528UXL 15-inch SVGA digital monitor
- A Video 57P 64-bit video card
- A Pro Case mid-tower case with power supply
- A Genius serial mouse and a no-name keyboard (with Windows 95 START key)
- A Rockwell 28.8Kbps internal fax/modem
- A SoundBlaster Value CD 4X kit with sound card, CD-ROM drive, and two speakers

Now that we've gathered all the components, all we have to do is build the computer.

■ First, The Disclaimer

Before you start calling mail-order computer parts companies and piecing together your own monster machine in your basement laboratory, heed these words of caution: We

believe experienced computer users can pull this project off, but we won't guarantee an easy success. It's impossible for us to describe every installation and setup scenario out there; if your motherboard, CPU, or operating system is different from the ones used in this article, you might have to make some difficult decisions on your own. If you're uncomfortable tinkering under the hood of your current computer, you probably shouldn't risk the considerable time and money a project like this can require. If you have any doubts, don't do it.

That said, our experience in assembling our own PC went surprisingly well. It seemed, in fact, easier than some typical hardware upgrades. Our theory: Working with all brand-spanking-new components is the equivalent of painting on a new canvas. We weren't limited by the constraints of an old motherboard or a case that simply couldn't hold another drive. We weren't trying to convince an old computer to accept something new; we were putting quality parts together for the first time. It still took time, patience, and probably more luck than we would like to admit, but it worked.

■ Do Your Homework

Before you plug in one board or attach a single cable, read the documentation that accompanied all your new hardware. If you're missing any manuals, call the manufacturers and have them sent out before you get started. Read everything carefully, but pay special attention to the information about your motherboard and hard drive. The motherboard documentation will tell you whether and how you need to set your jumpers, and it should provide a detailed description of all the parts you'll need to identify during the building process. The hard drive paperwork should explain how to install the drive and what you must do to configure it with your system.

If you decided to re-use any of your old computer components, make sure you have the documentation for those as well and write down the current configuration of your hard drive (available from the system setup screen, which we'll explain later) if you plan to use it again.

The instructions in this article should be enough to help you build a PC, but they are limited by space. If you feel you need detailed articles on the installation of each component, see our *Guide To Upgrading*, which can be ordered from the Back Issues number listed in this issue's table of contents.

After you've read all your materials (we mean it!), decide where you want to build your computer. It should be an area with plenty of space, good lighting, and easy access to a power outlet with a surge suppressor. Gather up all your computer components (still in their protective packaging), a Phillips screwdriver (we prefer the power variety with a nonmagnetic tip), and the boot diskette and installation diskettes for your operating system (we strongly recommend Win95 because of its Plug-and-Play feature that should automatically recognize and configure new hardware). Now it's time to build. Almost.

■ Hold It, Sparky

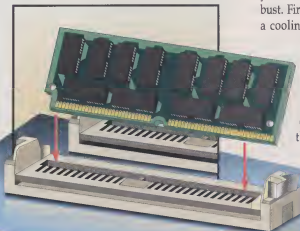
Before you remove any of your new components from their protective bags, you must release the static charge you might be carrying. Touching the unpainted metal frame of your

Before plugging in one board or cable, read the documentation that accompanied your new hardware.



computer case should do the trick. Remember to ground yourself often because it doesn't take much time to build a charge, and even a mild one can damage some of your more delicate computer parts.

We recommend assembling your main components and testing them before you install them in the case. That way, if there is a problem, you don't have to peer into a



Your RAM SIMMs should slide in at about a 45-degree angle and then pop into a vertical position.

cramped space to try to figure out why your hard drive isn't working.

■ The Motherboard

The first order of business is the motherboard. When we removed our motherboard from its protective bag, it was pretty much

ready to go. That's the beauty of purchasing most of your components from one store. We had the people at Computer Craft Inc. (where we bought most of our equipment) install our Pentium CPU and fan, pipeline cache, and random-access memory (RAM) onto the motherboard. They took care of all the necessary jumper settings and ensured everything worked before it left their shop. You can do this all yourself, but if you can find a good store to do it for you, we highly recommend it.

If you insisted on buying these parts separately, however, installing them on the motherboard is the first thing you need to do. If your motherboard came with a protective sponge mat stuck to its underside, leave it there when you set it down at your workspace.

Otherwise, make a bed of newspapers to set it on to protect the underside of the board as you work. When you do handle the board, make sure you hold it by the edges and try not to disturb any of the chips or electronic gizmos that populate the interior of the board. Check the documentation for your CPU and motherboard and find out whether you need to set any jumpers to accommodate your components. Once you have done that, you can install the brains of the operation.

CPU. Installing a CPU isn't difficult, but if you do it incorrectly, the whole project is a bust. First, determine whether your CPU has a cooling fan (Pentium CPUs require their own fan) and whether you need to attach it. The CPU fan requires a power supply to operate, so don't forget to plug it in later when you are connecting power supply cables to your drives. Once you get the fan mounted, examine the CPU socket on your motherboard and determine whether it is a zero-insertion force (ZIF) socket with a lever attached or a low-insertion force (LIF) socket with no lever.

To install your CPU in a ZIF socket, lift the lever to about a 90-degree angle, align the pin number one on your CPU with the pin number one designation on the socket, put the CPU down into the socket, and lower the lever down alongside it. You should see the CPU lock into place. If your socket is the LIF variety, again you

need to align the two pin number one markings, then push the CPU down into the socket until it is seated securely.

RAM. To install your RAM SIMMs, you first must find the correct sockets on the motherboard. Your motherboard's documentation should show you where the RAM sockets are and how to line up the SIMMs correctly. Different sockets accept SIMMs differently, so be sure to read your documentation.

Most of the time, you can simply slide the SIMM in at about a 45-degree angle, then pop it up into a vertical position. There should be a post or clamp at each end of the socket to hold the SIMM in place. Once the SIMM is in place, it should not move around. If it does, you need to try again.

Pipeline cache. The pipeline memory module should have a designated socket that accepts the module with little effort. Check your documentation and follow the instructions there.

Port connections. While you are working on the motherboard, you might as well take a moment to plug in the two COM port cables and the parallel port cable. See your documentation to find where the connections are on the motherboard and make sure you line up the colored edge of the ribbon with the number one pin on each connection. After you have the cables installed, set the actual ports and their metal brackets off to the side of your motherboard. Never set anything on top of your motherboard.

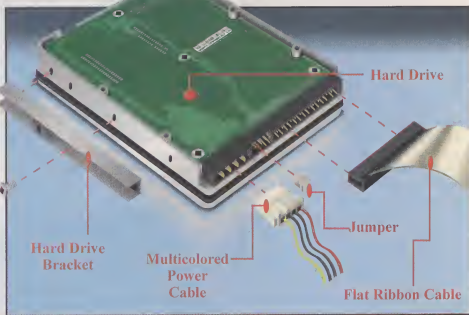
Once you have all the essentials loaded onto your motherboard, you need to connect it to the power supply. To do this, you must remove the case lid and set the case with the open side of the internal framework facing toward you. In the tangle of colored wires extending from the power supply box at the back of the case, there should be two white, flat connectors (they're usually labeled P8 and P9) with six multicolored cables each. This is the link between your motherboard and the power supply. Find the 12-pin power supply connector on your motherboard and insert the two sets of connectors with the double black wires side-by-side in the middle. It's very important that you connect the power correctly, or you can damage your new motherboard. Make sure there are four black wires in a row in the center when you finish.

■ The Essential Drives

Diskette drive. Now that your motherboard is mostly ready to go, you need to give it something to work with. First on our list of components is the diskette drive. To identify the ribbon cable used for the diskette drive, look for a cable that splits into three parts; the middle strand has a twist in it. Connect the cable to the back of the diskette drive, making sure that you line up the colored edge of the ribbon with pin number one. Though you might have to look hard to see the pin number marking, it is there. Be sure to push the connector in all the way. Now run the cable to the IDE interface on your motherboard (check your documentation if you can't find it) and connect

Hard drive. Next on our list is the hard drive, which installs almost exactly the same way as the diskette drive. Find your second ribbon cable (the one without a split) and attach it to the drive, making sure the colored edge of the cable lines up with the number one pin, on both the drive and the IDE interface on your motherboard. Be sure to push both ends of the cable in all the way.

When you're ready to plug in a power supply cable, remember the CPU cooling fan we talked about earlier and insert its power cable between the cable from the power supply box and your hard drive. (The power supply cable connects to the fan cable, which connects to the hard drive.) Be sure to seat the cable firmly onto the pins on the drive.



Most computer cases require some type of hard drive bracket to secure the drive in the bay. When attaching cables to the hard drive, ensure that the connectors are securely seated on the pins at the back of the drive.

it. Be sure to line up the colored edge of the ribbon with pin number one.

The diskette drive needs power, so go back to your power supply box at the back of your case. Grab one of the standard power supply lines (it should have two plastic connectors, a big one and a little one) and run it to the back of your diskette drive. The drive should take the smaller of the two connectors, and it should only accept it one way. Be sure to seat the power connector fully on the diskette drive pins and set the drive down on the table off to the side of the motherboard.

■ Monitor And Video Card

If everything is going as planned, you now should have a basic functional computer. But to test that theory, we have to see what the computer is doing. To do that, we must get the monitor and the video card operating.

To install your video card, pick an appropriate slot on your motherboard (check your documentation if you're unsure which to use). Line up the card so the metal bracket that houses the monitor port on the card hangs off the side of the motherboard. Gently but firmly push the card into the slot. Be sure to push the

card all the way in, then connect the cable from the monitor to the port.

■ Test Run

It is almost time to give your new computer a test run. But first, find the keyboard connector on your motherboard (a short round connector located on one of the corners) and plug in the keyboard. Next, look at the diagram for your case and find out how to connect the power switch on the front of your computer to the power supply at the back of the case. There should be a long, thick black cable that runs out of the power supply. On the end of that cable should be four smaller colored cables. Your documentation should show which prongs each of those four cables connects to behind the power button. Now plug the power cords into the back of your case and monitor and the surge suppressor, cross your fingers, and push the power button.

You should hear the power kick on and your system begin to operate as the hard drive and fan start spinning. You also should see information appearing on your monitor. So far so good.

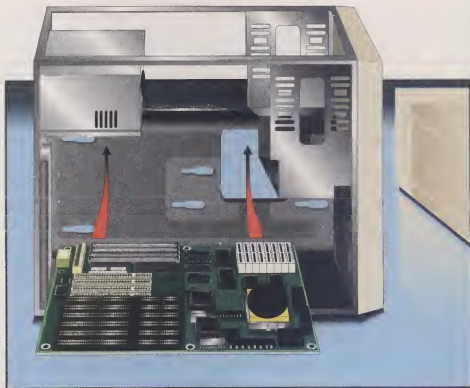
Now press the setup key on your keyboard. Different motherboards assign this function to different keys, so check your documentation (or possibly the screen in front of you) to see which one applies to you. Ours was the DELETE key. Pressing the correct key should send you to some type of setup screen.

■ Configuration

When you arrive at the system setup screen, you should have some type of menu. Choose the Standard CMOS Setup (or your version of it) option and type in the time and date, the diskette drive type (1.44MB), and the video type (VGA or SVGA).

If you're using an old hard drive and you know all of the drive's vital statistics, you can type them in here. If you have a new hard drive, follow the instructions in your documentation on how to run the autodetection utility. Hard drives can be tricky beasts, but if you have new equipment, it shouldn't be that difficult. Just be sure to read all about your hard drive before you get started.

Return to the main menu and work your way through the rest of the categories, reading everything carefully and making only changes where you need to. If you are unsure about a category or listing, leave it at the default setting. You can always come back and change it later.



Note that when you install the motherboard, several cables and cards will be connected to the board. They are not shown here so we could better illustrate the motherboard's installation position.

Save and exit the setup screen and turn off your computer. Now it is time to install your operating system.

As we mentioned before, we recommend Win95 for your new machine. We admit Microsoft's baby is far from perfect, but most new applications are written for Win95, and the operating system can help make your hardware installations easier. Some users are staunch OS/2 Warp supporters, but IBM's operating system has a vastly smaller marketplace following.

Since we don't have a CD-ROM drive installed yet, we used the diskette version of Win95 to install the operating system on our machine. This process takes some time, so as you wait for the signal to insert one diskette after another into your diskette drive, occupy yourself with some necessary tasks. These include separating and identifying the various types of screws included with your case and brushing up on your knowledge of Win95 hardware installation tactics.

Once you have Win95 up and running to your satisfaction, close out of the operating system; shut off the PC; unplug the power cords, monitor, and keyboard; and prepare to

transplant your computer's guts inside the case where they belong.

■ The Case

If you are careful, you can move your motherboard and drives into the case without having to unplug anything.

The first thing you need to install is the motherboard itself. In a tower case, the motherboard rests on the left side of the case, inside the internal frame but behind the framework for the drive bays. Insert the pegs into the appropriate holes in the back of your motherboard. Carefully slide the motherboard in and up into the appropriate position with the keyboard connector and monitor connector on your video card in line with the openings in the back of the case. Be careful not to unplug your drives or to dislodge your video card.

Gently insert the pegs into the slide holes in the back of the internal frame, being sure to keep the bottom of the motherboard from actually touching metal. Find the aligned screw holes in the motherboard and the frame and secure the motherboard, being careful not to tighten the screws too much. Attach the metal

bracket on the video card to the back of the case using the appropriate screw. Now attach the serial port and parallel port brackets to the back as well.

Once you have the motherboard in place, you can take a moment to attach the wires that lead from the case's front display to the motherboard. These are the wires that make the reset button work and the hard drive light flicker, among other things. Consult your case and motherboard documents to find out which wires go where.

Once you have completed this monumentally tiny task—the connectors are really small—move your hard drive into the bottom 3.5-inch drive bay. You may have to attach a metal extender to one side of the drive (most cases include them) to make it fit properly in the bay. Then simply slide the drive into place and secure it using the appropriate screws. Take a moment to make sure the plastic cover is in place on the front of the case, to protect the hard drive.

Installing the diskette drive involves essentially the same procedure. When you get ready to slide the drive into place, be sure to remove the plastic bay cover on the case and mount the front of the drive flush with the front of the case. Secure the drive to the internal frame.

Once you have the motherboard and drives in the case, we recommend plugging the power cords, monitor, and keyboard back in to the surge suppressor and making sure it all works. If you did knock something loose, now is the time to find out, before you start putting in more boards and drives. Once you've determined that everything is working (or taken steps to make it so), unplug the power cord again and get busy with the last few items on your list.

■ Finishing The Job

Mouse. The next order of business should probably be your mouse, since it will make the rest of your installation tasks a bit easier. If you installed Win95 as your operating system, its Plug-and-Play capabilities should make mouse installation pretty easy. Shut down your computer and plug your mouse into the serial port. Now restart your computer. When

we did this, Win95 realized that we had added a mouse to the mix and asked whether we wanted to install it. Hopefully, you'll have the same luck we did, and the installation should be as easy as following the instructions on the screen.

If Win95 doesn't detect the new mouse during the bootup, use the arrow keys to open the My Computer icon. Open the Control

The CD-ROM drive installation proved as simple as the rest. That probably had a lot to do with buying a kit.



Panel icon. Open the Add New Hardware Icon and follow the instructions there for detecting a new piece of hardware. If Win95 doesn't detect the new hardware, follow the instructions on the screen for manually installing your mouse.

If you continue to have problems, consult your Win95 documentation or the instructions included with your mouse.

Once you have your mouse up and running, you can move on to the modem.

Modem. Installing an internal modem is pretty simple. Shut down your system, unplug everything, and find an open slot on your motherboard. Insert the modem card in the same manner that you did the video card, using steady force to push it in all the way. Then secure the bracket to the back of the case using the appropriate screw.

Again, follow the procedure for detecting new hardware. If all goes well, Win95 will make this job an easy one. Then simply install your modem's software following the instructions in your documentation.

CD-ROM drive. We expected the CD-ROM drive installation to be among the more difficult, but it proved to be as simple as the rest. That probably had a lot to do with buying a kit. We purchased a Creative Labs SoundBlaster Value CD 4X kit from A+ Computer and avoided the possible pitfalls of piecing together a separate CD-ROM drive and sound card.

In the Creative Labs kit, the CD-ROM drive operated off the sound card through a ribbon cable and an audio cord. Connect the ribbon cable and audio cord to the SoundBlaster card and insert the card in a slot in your motherboard. Make sure the metal bracket with your speaker and joystick ports lines up with an opening in the back of the case. Secure the bracket with the appropriate screw. Then attach the ribbon cable and audio cord to the back of the CD-ROM drive. Install the CD-ROM drive in one of your 5.25-inch bays and secure it to the internal frame. Now connect a power supply cable to the drive.

Plug your power cables back into the wall outlet and restart your computer. Win95 should detect your new card and drive. Follow the procedures on-screen and install the necessary device drivers and other software. Once you have the CD-ROM drive running and the speakers plugged in and working, turn off your machine one last time.

Tuck all cables and cords neatly into the interior of the case. Slide the lid back on, replace the screws at the back of the case, and you're finished.

Start up your new machine, sit back, and admire your work. You now have a one-of-a-kind computer that should be easier to upgrade and repair than any manufactured model. You didn't have to buy anything you didn't want, and you didn't have to settle for somebody else's idea of a dream machine. And you did it all by yourself. ●

by Tom Mainelli

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Portable Printers:

Hard Copies On The Road

Not long ago, a portable printer usually amounted to a laughable hunk of machinery that a user had to haul around like an inmate's ball and chain. Emanation from the desk was granted, but at a high price. Performance was slow, quality was pathetic, and portability was almost unrealistic.

In recent years, portable printers have ridden the same wave that made notebook computers practical. They've decreased in size to the point of usefulness, without sacrificing performance. The latest printers for the road have come close to equating themselves with their desktop brethren. Speed and quality have increased substantially, and color printing has transcended from a traveler's pipe dream to an actuality.

We looked at two of the top models of portable color inkjets and also took a peek at one of the tiniest black-and-white printers on the market today. We tested them on a Toshiba Satellite T2100CT notebook computer running the Windows 95 operating system (OS).

Criteria

We looked at these portable printers from four angles: installation, portability, performance,

and features. For the printer installation angle, we considered the physical "hooking up" of the printer via a parallel cable, how easy the drivers were to set up on our computer, and how difficult it was to insert and change the ink cartridges.

Our next test involved a look at each printer's portability. We judged this by the physical statistics of the printer (dimensions and weight) and also by how many pages the machine would print when powered only by the battery.

For the performance segment of our comparison, we looked at both the printer's speed and the quality of its output. Speed is measured in pages per minute (ppm), and quality is measured in dots per inch (dpi). (Dots per inch is a measurement of the resolution of printed images. The more dpi, the higher the resolution and the sharper the image.)

We performed both a black-and-white and a color test on the printers, each at standard printing (usually the default print setting) with letter-size paper. For our black-and-white test, we printed an eight-page document that averaged around 2,000 characters per page and used several headings in bold text and many italicized statements. For our color test, we printed one page that contained one large graphic and several smaller ones.

Finally, we looked at the packaged and optional extras for each printer. This included sheet feeders, adapters, and software. The extras on most portable printers will vary and have an effect on what printer a user might want or need.

Canon BJC-70

From the first glance at Canon's portable model (which runs around \$350), we were impressed. If an aesthetic appearance is any indicator of performance, the BJC-70 seemed like it could hold its own. This sleek printer

looks more like a high-tech CD player than a hard-copy producer. Upon further examination, we found that the BJC-70 lived up to its technological look.

Installation. The BJC-70 was easy enough to hook up. It came with drivers for Win95, so we had no problems getting it set up as our default printer (the printer where output is automatically sent to). The parallel cable is seen by many printer companies as an optional extra, so if it wasn't included with your notebook, you'll need to shell out a few extra bucks to get one. The ink cartridge installation was equally simple. We swapped the black-and-white and color cartridges several times and never ran into problems putting in the new one or having the printer accept it.

Portability. Although not tiny by any stretch of the term, the BJC-70 is easily portable. It weighs a little more than 3 pounds and measures 11.8 inches x 6.2 inches x 2.2 inches when the sheet feeder is folded over. The battery pack (also considered an optional extra by Canon, it will cost around \$99 for the battery plus an attachment unit for recharging) will print up to 200 pages before needing a recharge.

Performance. Portable printers have always been a lot slower than their desktop compatriots, but the BJC-70 was the fastest printer of the bunch. In our black-and-white test, the BJC-70 averaged around 3ppm. It took the printer one minute and 50 seconds to completely print the color page. The BJC-70 prints black and white at 720 x 360dpi and color at 360 x 360dpi. The color page looked sharp, but there was some bleeding around the edges of smaller images in the graphics. The black-and-white pages were very high quality but could have been a little darker.

Features. The BJC-70 has a built-in sheet feeder, which holds up to 30 sheets of letter-size paper. Since it amounts to little more than a lid



The Canon BJC-70 combines a sleek look with high-quality performance.



The Hewlett-Packard 340 is a bulky, but inexpensive, printer that delivers great output for its price.

when folded down, the sheet feeder adds convenience with almost no extra size or weight.

The software that comes with the BJC-70 is beneficial. It features a *Color Advisor* to let users choose custom colors for their documents and save settings they might want to use again later. Also included in the software package is Canon's *TrueType Font Pack*, which contains 20 scalable fonts and a Visual Guide with detailed, on-screen instructions for using the printer.

Overall, the BJC-70 matches well with its price. Its performance and portability make it an excellent printer to take when you're on-the-go.

■ Hewlett-Packard DeskJet 340

Looking like a slightly shrunken version of a desktop printer, the HP DeskJet 340 (costing around \$300) matches the performance of a desktop but is not as totable as many other portable printers.

Installation. Our 340 came with printer drivers for DOS or Windows 3.1, and Win95 refused to recognize them. We used one of the pre-installed drivers in Win95, but it limited our options. Luckily, HP has an incredibly

extensive World Wide Web site at <http://www.hp.com>, and we downloaded the latest driver for the 340. (For more information on downloading drivers, see "Behind The Wheel Of Device Drivers" in this issue.) With the new driver and the optional parallel cable (\$19), we had no problems getting the printer hooked up to our notebook.

The cartridge installation went smoothly. The 340's performance was also unaffected by our constant cartridge-swapping.

Portability. Although not a ball and chain, the 340 has more in common with the old-style "luggables" than the trimmer new portables. With the sheet feeder attached, the unit weighs almost 5.5 pounds and measures 12.2 inches x 3.8 inches x 5.8 inches. The battery pack (which can be bundled with the HP printer for about \$20 more) will print about 100 black-and-white or 23 color pages.

Performance. The 340 was slothlike in its printing speed, but it printed high-quality products. On our black-and-white printing test, the 340 printed approximately 2ppm while it took almost two and a half minutes to produce the color page. The color kit, with a color cartridge and a cartridge storage case, was once optional but is now bundled with the 340.

The 340's resolution is 600 x 300dpi for black and white and 300 x 300dpi for color. The graphics on the color printout were sharper than on the Canon's, but the contrast wasn't as good. (There were a lot of spots that were too dark, making it hard to see some of the smaller images.) The black-and-white printing, though

slow, was excellent. The characters were sharp and dark; they looked as if they had been laser printed.

Features. About the only extra included with the 340 was the sheet feeder. The 30-sheet holder is a great asset but adds another pound to the already bulky printer. The software that came with the printer didn't work with Win95, but the driver package we downloaded included the *DeskJet Status Monitor*. The monitor worked in the background and kept us informed of how the printing was going and let us know if any problems arose.

There are several optional extras for the 340, including a Macintosh adapter, a rapid recharger for the battery, and an infrared (IR) adapter. The IR adapter, one of the first offered with a portable printer, allows for wireless connection to your notebook computer. The adapter costs around \$39 and grants freedom from at least one set of cables.

The 340 is a bit big for true portability but performs very well for its low price.

■ Pentax PocketJet

If someone handed you a Pentax PocketJet and said it was a portable printer, your first thought would probably be, "Yeah, and the Commodore 64 is on its way back." The only thing is, they'd be right. The \$429 PocketJet doesn't look as if it would be able to hold down paper in a stiff breeze, much less print on it. It has a couple of catches, but for the most part, it's an ideal portable.

Installation. The PocketJet hooked up easily to our notebook. The parallel cable was included, and the printer uses the HP LaserJet IIP driver (a common driver that was on our Win95 diskettes), so we had no problem

Portable Printer Pointers

Portable printing is not for everyone. And there is no one printer that will meet the needs of everyone who wants hard copies on the road. If you are looking to purchase a portable printer, here are some factors to consider:

- **Make sure the printer you're adding will be the most beneficial to you.**

If you're only going to be printing black-and-white text, a color printer may be overkill. On the other hand, if you might be doing color printing in the future, make sure the printer you purchase will accept a color upgrade kit.

- **Consider size and weight restrictions.**

If you're planning to print documents during a flight, you might

want to consider something ultra-compact, such as the PocketJet. If you have a little more room and need the extras such as color printing or an infrared adapter, take a look at something larger and more extensive (i.e., the Canon BJC-70 or the HP 340).

- **Take into account how much a printer might take out of your account.**

Make sure you'll be using a portable printer enough to justify the cost. If you type a document during a trip and can afford to wait until you're back at your desk to print it, a portable printer won't be that advantageous.

A good rule of thumb is convenience. If a portable printer will save you time, it might be worth the money. ○

getting connected. Since the PocketJet is a thermal printer, we didn't have to worry about installing the ink cartridge. (A thermal printer uses heated pins to "burn" images onto heat-sensitive paper.)

Portability. The portability of the PocketJet is simply amazing. The printer measures only 1.2 inches x 10 inches x 2.2 inches and weighs little more than a pound, even with the battery installed. The rechargeable nickel-cadmium battery comes with the PocketJet and will print around 30 to 35 pages before needing a recharge.

Performance. The PocketJet fell neatly between the other two printers in both speed and quality of printing. It has no color capabilities so we only subjected it to the black-and-white test. The printer ran at about 2.5ppm but could have gone a little faster with a sheet feeder.

Pentax's tiny PocketJet printer is pricier, but its size and comparable quality make it an ideal portable.



One of the PocketJet's drawbacks is this omission, making the user hand feed each sheet.

The PocketJet's resolution is 300 x 300dpi, producing near-laser quality with its thermal printing. Like the Canon, it could have printed a little darker, but the pages looked very sharp. The thermal printing presents another drawback to the PocketJet. The printer uses no ribbons or ink (a cost-saver in itself), but it does need special heat-sensitive paper to print on. It comes with a box of 100, with additional boxes available at a cost of \$8 for 100 letter-size sheets.

Features. The PocketJet comes with everything you need not only to get started, but to also jump in your car, head off down the road, and print away. As mentioned before, in addition to the standard AC cord to plug into a wall socket, the PocketJet includes the parallel cable and rechargeable battery.

The PocketJet doesn't have any software options, but it does come with a nice carrying case to help protect this minute printer while you're traveling (and maybe to make it a little more noticeable, so it doesn't get lost in the car seat).

The PocketJet is a little more expensive, but it comes with all the options and embodies the essence of a true portable printer.

These printers have undergone major transitions since their introduction. They're not perfect printing machines, but most of them are good at what they do—and some of them are simply amazing. ●

by Joel Strauch

For More Information:

BJC-70
\$350
Canon Computer Systems Inc.
(800) 848-4123
(714) 438-3000
<http://www.usa.canon.com>

DeskJet 340
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Quick Comparison

	Canon BJC-70 \$350	HP 340 \$300	PocketJet \$429
PORTABILITY	SIZE	11.8 x 6.2 x 2.2	1.2 x 10 x 2.2
	WEIGHT	3.1 LBS	17.5 OZ.
	BATTERY LIFE (IN SHEETS PRINTED)	200	30-35
PERFORMANCE	SPEED -- COLOR (IN TIME TO PRINT ONE PAGE)	1 MIN 50 SEC	2 MIN 30 SEC
	B&W (IN PAGES PER MINUTE)	3PPM	2.5PPM
	DPI		
	COLOR	360 x 360	N/A
	B&W	720 x 360	300 x 300
FEATURES	30-PAGE SHEET FEEDER	30-PAGE SHEET FEEDER CARRYING CASE	BATTERY PARALLEL CABLE

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Finding Folks Through The 'Net



The list of examples like these grows every day as greater numbers of people wade into the Web.

■ Who You Are

Susan Friel-Williams, the leader of America Online's adoption forum, spends a lot of time performing similar searches from her home in Loveland, Colo. She estimates she's handled more than 14,000 requests to help adoptees and natural parents find each other.

Nowadays, she does most of this searching through her computer.

"Sometimes it can be incredibly easy," she says. "Usually it's not, but sometimes it can be."

If clients provide a full name for the person they seek, computers can make the search almost effortless, she says. Many times, the only

steps involved are slipping in a

commercially available CD-ROM phone directory of the United States and pulling up the desired information. "It's that simple," she says. Most people just don't realize such CD-ROMs, compilations of the nation's phone book listings, exist.

When nothing turns up on her own computer, Friel-Williams turns to commercial online services and the World Wide Web. On AOL, she likes to use the search engines at places such as the Military City Online area and her own adoption search forum. Sometimes the general AOL members' list can provide valuable information. If Friel-Williams strikes out with her own service, friends who lead similar adoption forums on other online services might be able to help, she says.

for discovering something about almost everyone.

Consider a few examples culled from Switchboard, a large World Wide Web site that acts as a sort of nationwide phone book:

- A veteran who spent 27 years searching for an old Air Force friend found him in South Carolina with a single Web search.
- A shopper picked up a lost credit card in a mall and, after consulting with Switchboard, returned it to its owner.
- A Detroit lawyer trying to find a boyhood friend who moved south when the pair was 10 years old engaged a private detective to no avail. A single session on the Web located the missing buddy.

Even if you've never used the Internet, it might be using you.

Two forces—the growing number of computers connecting to the Internet and the increasing amount of information about the average person being stored digitally—are combining to make the global computer network the new frontier for finding lost relatives, old friends, and even once-private facts about strangers. The fast access the 'Net offers to databases filled with names, numbers, addresses, and other tidbits makes it a source



On the Internet, Friel-Williams' phone book of choice is Switchboard, the aforementioned online directory listing addresses and phone numbers for more than 90 million people and 10 million businesses (for the Web address of this and other sites mentioned, see the table on the next page). Switchboard is perhaps the most comprehensive of a handful of online phone books combining white and yellow pages with easy-to-use search capabilities.

The Switchboard interface is straightforward and fast. The page includes a short form for users to fill out with spaces for a last name and any other information available about a person, such as the first name, city, and state. A mouse-click on the search button sends the information to the Switchboard computer, and results are transmitted back through the Internet and displayed automatically on the client computer. Most listings include standard phone book information such as name, address, city, state, and phone number.

Users who fill out the free Switchboard registration form can update their listings to include E-mail addresses, Web home page addresses, and affiliations with companies or other groups. Those who want to can remove their names from the database altogether.

One of Switchboard's most interesting features is called "knock-knock," which allows users to be accessible through the Internet without making information about themselves publicly available. Persons using the knock-knock feature show up only as a name in Switchboard listings. Other users can send E-mail to them through Switchboard without knowing the actual E-mail address, allowing a certain amount of privacy.

Similar to Switchboard is the whimsically named Bigfoot, a global E-mail directory that can be configured to display instructions in German, English, or Spanish. Four11 is another useful Internet white pages with 6.5 million listings focusing mainly on E-mail addresses rather than phone numbers. The listings are culled from half a million voluntary registrations, public sources such as Usenet newsgroups, and registrations from Internet service providers. Like Switchboard, both Four11 and Bigfoot include group connection features where users can note

Aside from looking up facts about people, you can poke around the 'Net's many corners to find things they have actually said.

their alma mater, interests, services, and other information.

One noteworthy feature at Four11 is the site's support of Versit Cards, a new, standardized format for personal information. After you locate someone in the Four11 directory, the information can be automatically downloaded into personal information manager programs that support the standard.

An interesting directory called BigBook won't locate where people live, but it might help pinpoint where someone works. BigBook is designed to be a nationwide electronic yellow pages with 11 million U.S. business listings. Other databases include businesses, but BigBook has one giant advantage: maps. In addition to finding business phone numbers

and addresses, you can see a map marking the location, anywhere in the country. We tested this feature with our own offices and found it was a few blocks off, but the concept is still remarkable. You can also turn it around and find, say, all bakeries within a certain neighborhood or city.

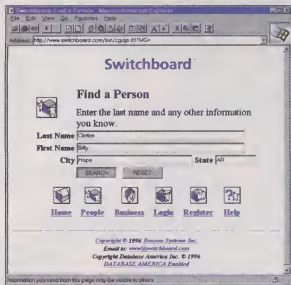
■ What You Say

The BigBook idea shows the intriguing potential for computerized phone books to combine different kinds of information in one spot, but they aren't the Internet's only tool for tracking down people. Aside from looking up facts about people, you can poke around the 'Net's many corners to find things they have actually said. Private E-mail conversations are, of course, inaccessible, but public conversations in the Internet's Usenet newsgroups are there for all to see.

Newsgroups are like huge bulletin boards where users read messages others have left and respond by tacking up a message of their own. Tens of thousands of newsgroups exist and are devoted to almost every topic imaginable. Not all newsgroups are available from all Internet service providers, but most people can count on being able to read the core 10,000 or 20,000.

Each newsgroup post generally contains certain information about its author, including name and E-mail address. Some newsgroup programs let users enter bogus names and addresses, which lets them post more or less anonymously. However, most people use at least their true E-mail addresses so that other newsgroup readers can respond to them directly rather than pinning up a public message. Actual names are more common in certain serious newsgroups where they lend credibility to opinions. Users are less likely to believe someone who won't even say who they are.

For the would-be Internet detective, these posts can provide a valuable window into the lives of frequent Internet users. Several search engines troll the newsgroup waters for messages containing whatever keywords interest us; you might search for posts featuring a certain topic or by a certain author. Newsgroup posts can potentially give us a whole handful of facts—not only people's E-mail addresses, but also



Switchboard can help users find anyone in the United States. Now what ever happened to Billy?



what they talk about and where they talk about it. For instance, a search for Joe Smith might pull up several messages from the "alt.tv.x-files" newsgroup and a couple of others from the "rec.pets.cats" group. Now we have Smith's E-mail address along with the knowledge that he probably likes the television show "X-Files" and owns a cat.

One of the best newsgroup searching pages is Deja News, a site devoted solely to finding such posts. The interface lets users target certain newsgroups or dates or set broad limits like recent messages or old messages. Another good place to check out is InfoSeek, a comprehensive Internet search engine that can be configured to look at newsgroups.

If nothing pans out in newsgroups, InfoSeek also can page through Web sites themselves, the third major way of locating names on the 'Net. The Web is a vast and growing collection

of electronic documents with somewhere in the neighborhood of 30 million pages of information. Searching this menagerie for a specific name could find a page authored by the person or pages mentioning the person. With more newspapers and other content providers going online, the Web can offer factual information about anyone in the public eye.

The key to finding Web mentions is to use a search site that not only indexes page titles but the entire text of a page. The best of the bunch is probably Digital's Alta Vista search engine. Alta Vista allows complex search requests and returns speedy results from both the Web and newsgroups, although it can be difficult to narrow down a search to include only useful items. A new site worth taking a look at is MetaCrawler, which takes your query and runs it through nine search engines, deletes duplicate hits, and returns the results on one screen.

Tools such as MetaCrawler, Deja News, and Switchboard undoubtedly make the Web a far more useful collection of information, but such easy access to all of this personal data may have a few unintended consequences. Some people don't want to be found—and for good reason.

■ Where You Live

An incident involving Yahoo!, a popular Web directory, illustrates one of the more unsavory implications of the Information Age. Yahoo! planned to launch an online phone book of its own this spring and nailed down an agreement with New Jersey marketing firm Database America to provide the listings. Database America cobbled together its 170 million names from scores of magazine subscription lists, product warranty cards, credit reports, and other lists acquired over time

Where Are You?

It isn't quite as easy to find someone using the Internet as it might seem from movies and television, but computers can be a helpful tool in some cases. Here are some of our picks for the most useful search tools when you want to find that certain someone.

NAME	ADDRESS	Phone, Address or E-mail	Business	Name in Newsgroup Posts	Name in Web Page Text
Alta Vista	http://altavista.digital.com			X	X
BigBook	http://www.bigbook.com		X		
BigFoot	http://bigfoot.com	X			
Deja News	http://www.dejanews.com			X	
Four11	http://www.four11.com	X			
InfoSeek	http://www.infoseek.com	X		X	X
Lycos	http://www.lycos.com				X
MetaCrawler	http://www.metacrawler.com				X
Switchboard	http://www.switchboard.com	X	X		
WhoWhere?	http://www.whowhere.com	X			
World E-Mail Directory	http://worldemail.com	X	X		



from other companies. This buying and selling of names is a profitable practice in which many mail-order and marketing firms engage to find new customers.

However, Yahoo!'s plans to make the listings available on the Internet drew fire when people began to realize the information went beyond what we see in the phone book. Judges, law enforcement officials, undercover police officers, FBI agents, and others with a critical interest in keeping addresses and phone numbers out of the public sphere suddenly found their personal information on display. Following inquiries from newspaper reporters, Yahoo! pulled the plug on the controversy after two weeks by agreeing to remove names not listed in existing white pages.

Evann Hendricks, editor and publisher of the Washington, D.C., newsletter *Privacy Times*, says Yahoo! did the right thing in the end, but the fact that the company didn't delete the names without some prodding is troublesome.

"I was just astounded it didn't cross their minds beforehand," Hendricks says. The list included addresses for people such as U.S. Attorney General Janet Reno, Hendricks says, and other officials he thinks most Americans would agree should be granted some degree of protection from nuts with computers. However, he says, no law specifically prevents similar public postings by other yahoos. Such sites might be subject to liability in the event of a related harassment or tragedy, Hendricks says, but it would take a tort case and a creative lawyer.

Hendricks advocates the creation of federal law protecting names and addresses from being used for unrelated purposes. With such a law, people would have legal recourse if filling out a magazine subscription card or buying a product online led to odd junk mail or the discovery of one's phone number plastered across the Internet. Hendricks calls the idea a "consistent purposes test."

In the meantime, he says, Netizens can help protect themselves by remembering that the Internet is a public place. What you say in places like newsgroups or chat rooms can come back to haunt you.

MetaCrawler queries multiple search engines for you, making it one of the 'Net's most powerful tools for finding addresses and phone numbers.

"Just realize that everything you do is potentially recordable, storeable, and discloseable," Hendricks says. "If you proceed from that basis, you can at least have an awareness."

Generally, the average person has little to worry about at this stage. But, Hendricks asks, what if something goes wrong? What if someone has a vendetta against you? What if someone is competing against you for a job or

political office? Then whatever you do or say on the 'Net is out there to exploit.

In such a scenario, the main causes for concern are newsgroups and chats. The often heated exchanges are not simply private flame wars between two people in a small room; they are archived public brawls for the world to see. Potential readers include people such as future employers, who might be interested to read posts you've left on politically related newsgroups or about other controversial subjects.

Those concerned with protecting their privacy should watch for any form on- or offline that asks for personal information such as names and addresses. Companies love to have as much info as possible about their potential customers, but that doesn't mean you have to give it to them. Even if a form seems benign, the information could be sold to other, less scrupulous companies. Once you get on one list, it is nearly impossible to weasel back into private life. Some organizations can't take people off lists even if they want to because of all the duplicates that inhabit today's marketing databases. That all leads to junk mail, phone solicitations, and potentially something like the Yahoo! debacle.

Some regular 'Net users employ fake names and addresses when possible for getting through intrusive sites. Many Web pages today require some sort of registration, a process that gives you a necessary password in exchange for filling out a little online form. In order to receive your password, you'll probably have to use your real E-mail address, but the name, address, and other information can be as fanciful as you like. Hardcore privacy enthusiasts might keep two E-mail addresses: one "public" and one "private."

This cloak-and-dagger secrecy isn't meant to cause paranoia. National phone directories and Web search engines perform a valuable service by making more information available to more people. Just remember that in a true Information Age, some of that data is bound to be about you—neatly indexed by keyword. ●

by Alan Phelps

Be careful what you say; Deja News searches newsgroup postings to find keywords or names.



The Hangups Of Videophones



videophone—if you pay tens of thousands of dollars for today's high-end systems. You also can for the more reasonable price of a PC and a few extra components—if you can live with jerky images and unreliable access. (See sidebar on next page.)

Don't be surprised by the high price tag of the best videoconferencing systems; unrealistic prices for developing technology are nothing new. When computers first arrived on the scene, they were so oversized and overpriced that individuals couldn't use them. But the technological developments and competition among manufacturers that helped make PCs a household product offer hope for

the videophone.

■ Can You?

Large, multinational corporations have always had an interest in videoconferencing. While it's amusing for us to see who we're talking to on the phone, having visual contact is an almost vital concern in many business situations. As expensive as videoconferencing is, it's a lot cheaper than purchasing plane tickets for everyone who needs to be involved in a meeting.

Bruce Ryon, director of the multimedia service program at the Dataquest market research firm, says *Fortune* 100 companies have been involved in videoconferencing since day one. And they're shelling out some big bucks to have good quality. "If you look at the business market, the average price (of a videoconferencing system) is about \$50,000," he says. "These are group conferencing

systems with a 19-inch or greater screen, doing at least 22 frames per second."

The quality of videoconferencing systems is measured by number of frames that change every second. To simulate real time, close to 30 frames per second (fps) are needed. Unfortunately, with current technology, it's very expensive to even approach real time.

There are cheaper systems out there, but they vary in quality and speed. "There is a whole range of products on the market," Ryon says. "You can get videoconferencing hardware in the \$1,000 range that will work over a POTS (Plain Old Telephone Service) line, but you're still talking only about 10 frames per second."

Most companies use these slower connections for the display of static images, such as data or the presentation of new products, not for head-to-head conferencing. But paying \$1,000 for shoddy images isn't what our dreams—and commercials—have shown us.

■ You Can . . . For A Price

Though prices of these systems may be dropping, it's not fast enough for the average consumer. The majority of videoconferencing users are still in the business world. Manufacturers just haven't been able to produce a decent system at a price low enough for consumers. AT&T does have a version of the videophone for consumers to use at home, but it leaves a lot to be desired.

"What AT&T is selling right now costs about \$1,000 for some really poor quality," Ryon says. "A lot of studies have shown the videophones in the home really have got to be in the sub \$150 level, and it has to be pretty close to real-time video."

AT&T's current offering is way out of the average consumer's price range, especially considering its less-than-perfect quality. "Let's say you want to talk to Grandma 2,000 miles away—it'll cost you two grand," Ryon says.

Another detraction of the videophone units is screen size. Whereas screens in business videoconferencing systems are good-sized (19 to 35 inches), home videophone screens are tiny. "What they're offering now is (Saltine) cracker-sized screens," Ryon says. Even in PC-based videoconferencing, video windows remain small to offer decent resolution.

Remember those cool commercials done by that giant phone corporation that demonstrated futuristic advances in technology? The ones that featured a voice-over by an unmistakable actor that started off with the question, "Have you ever wished that you could . . . ?" and then finished with the dramatically foreshadowing answer of "You will."

One of the most anticipated products presented in these commercials was the videophone—a telephone that lets you see and be seen. The exciting potential of this communications tool almost goes without saying. Have you ever wanted to call a friend in China and exchange facial expressions as well as conversation? Or eat dinner with your family from a thousand miles away? You can with a

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You know better than anyone how frustrating it can be when you need help with your computer and there's no place to turn.

First, you turned to your computer manuals only to find them full of techno-babble.

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- ☐ Yes ☐ No 3) provides information for computing in your home AND office? For example: PC Operating Instructions, Family Computing, At The Office, and Plugged In, just to name a few monthly departments.

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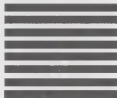
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... we'd like you to help us help others. Chances are your friends, family members, and co-workers are having the same feelings you did at one time about computers . . . **FRUSTRATION.**

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He sums up what a videophone would have to be like in order to make it in the home market. "It's got to be on a bigger screen, it's got to be pretty full frame rate, and it's got to be cheap."

■ You Will

The major problem with getting high numbers of frames per second is the same problem plaguing users with slow connections to the Internet—low bandwidth (the amount of data that can be transferred in a certain amount of time). In online communication, bandwidth is measured in the number of bits of information transferred each second—bits per second (bps).

If the bandwidth of Internet access were expanded by installing the higher-bandwidth Integrated Services Digital Network (ISDN) service for all videoconference participants, it would be easy to hold a conference over these communication links. (ISDN lines can transfer up to 64,000bps. See "ISDN Speeds Online Access" in this issue.) In fact, some people already do so for a relatively low cost. Connectix Corp. offers its QuickCam at \$100 for black and white and \$200 for color. Then all you need is some conferencing software and a fast Internet connection, and you're ready to go. (See sidebar at right to discover how we fared in a videoconference.)

Another problem with using the Internet is the high amount of traffic online. If you set up your own video-conferencing system, you have a guaranteed service, Ryon says. "Whatever bandwidth there is, it's reserved for you and nobody else. But on the Internet, you're dealing with a packet-switched environment where you can get packets held up pretty easily."

Packet-switching is quite a bit different from the normal use of a telephone line. During a voice conversation, even if you're not speaking, you have the whole line to yourself. But in a packet-switched environment, your output is digitized into a "packet" and shares communication lines with other packets of information. It is a much more efficient system because several users can share the line, but it can wreak havoc on a videoconference when packets gets delayed on a busy line. "It can get pretty nasty in terms of quality," Ryon says.

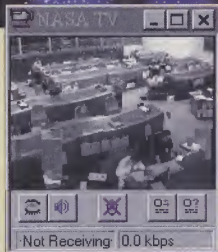
Videoconferencing, though on the verge of becoming part of our reality, still has some coarse tuning to go through. "It will really take a lot of infrastructure issues to be

resolved, namely the bandwidth and then just how cheap it is," Ryon says. "If it becomes as cheap as a telephone and as easy as a telephone call, I don't see any reason why it won't be ubiquitous." ●

by Joel Strauch

Houston, We Have A Problem...

With Our Slow Connection



We speculate that this is Mission Control in Houston on NASA TV.

We decided to see for ourselves what PC-based videoconferencing could be like over the Internet. We didn't have a Connectix QuickCam, but all you really need to see and listen to a videoconference is an Internet connection, a sound card, and videoconferencing software.

We had an Internet connection via a 28.8 kilobits per second (Kbps) modem and a sound card, so we set out to find the right software. CU-SeeMe's World Wide Web site at <http://www.cuseeme.com> suited us fine. We downloaded the latest version of *Enhanced CU-SeeMe* for a 30-day free trial. The file was pretty big (3.1 megabytes) but easy to install.

There were a few videoconferencing numbers already included in CU-SeeMe's phone book, so we tried to dial up NASA TV (it sounded interesting to tune in as the space shuttle attempted to retrieve a satellite). The main number was already full when we called, so we tried one of the mirror sites (a site that contains the same directory as the

original). The first one of these we tried, a reflector at Kent State, let us in.

As soon as we connected, we started getting an audio transmission that was understandable, but a little broken up. It was difficult to tell for sure, but it sounded like astronauts doing space stuff. We turned the video on, and the sound immediately cut out. It seems our connection wasn't fast enough to allow for both pictures and sound.

We also had a hard time keeping our picture on-screen for more than a few minutes. If our connection fell below 10Kbps for too long, the picture would shut off. We adjusted CU-SeeMe's preferences (we could set the minimum and maximum rates for our connection) to keep the picture up, but it was pretty tough to tell what was on the screen.

We saw a detailed image that could have been an astronaut hooking up a satellite, but that might have just been what we wanted to see. At one point, it looked like the camera panned down to show this fantastic shot of the earth—or it might have been someone moving a jar of Tang in the way.

We averaged about one to two seconds per frame (as opposed to frames per second) and never got higher than 2fps. We didn't learn a whole lot about satellite retrieval, but we did learn quite a bit about Internet videoconferencing—mainly that it's not ready for the average computer user. ○

For More Information:

CU-SeeMe

White Pine Software Inc.
(800) 241-7463, (603) 886-9050
<http://www.cu-seeme.com>

Find It ONLINE



Canon

<http://www.ccsi.canon.com>

Hewlett-Packard

<http://www.hp.com>

Epson

<http://www.epson.com>

Three of the biggest names in printing offer three of the biggest printer information sites on the Internet. Owners of Canon, Hewlett-Packard, and Epson printers can use these sites to complete product registration, receive technical support, search for a local service center, and download device drivers and other software that will tweak the performance of their printers. You don't have to own a Canon, Hewlett-Packard, or Epson printer to take advantage of this site, though. The product information and creative printing tips found here will satisfy almost anybody.

U.S. Department Of Education

<http://www.ed.gov>

Educators preparing for another nine months of learning activity will benefit from this site. The Department of Education provides free pamphlets, publications, and services to anyone interested in the

education of America's youth.

Links to other educational sites and grant and scholarship information can be found here as well.

Jon's Homeschool

Resource Page

<http://www.midnightbeach.com/hhs>

While most parents are getting ready to send their children to school, a growing number of moms and dads are preparing to bring school to their children. Jon's Homeschool Resource Page provides many valuable sources of information for these at-home educators, including helpful articles, answers to frequently asked questions, reading lists, advice on learning methods, addresses and phone numbers of homeschool associations, homeschool supply vendors, educational software, and links to Web sites, mailing lists, and newsgroups.

CollegeNET

<http://www.collegenet.com>

The process of looking for, finding, and paying for a college education can be long and tedious. CollegeNET simplifies the ordeal by compiling most of the data needed to make a confident and informed decision. This site

includes a searchable database of universities, four-year colleges, junior colleges, and technical schools that can be used to locate institutions that best match a student's needs. From the database, students can link to the Web site of a particular school (if it has one) for more information. Parents will find the financial aid information especially attractive.

The AT&T

College Network

<http://www.att.com/college>

After using CollegeNET to help find the right school, use the AT&T College Network to successfully make it through in four (or five or six or ...) years. The Study Channel offers links to a number of great research sites on the Web that will help students get passing grades on essays or exams. Visit the Jobs Station to find a profitable way of employing that degree. Students also can enter a number of contests and check out the free-ware. Oh, and of course, they have the opportunity to switch to AT&T.

RENT.NET

<http://www.rent.net>

Coldwell Banker Online

<http://www.coldwellbanker.com>

For as long as humans have had the urge to move, they've coped with the trials and tribulations of relocation. Fortunately, technology finds ways to make it easier: The wheel, steam engine, and airplane all made relocating more tempting and feasible. Now, the Internet offers another way of improving the moving process. RENT.NET lets users across Canada and the United States search for apartments in every major city in those two countries. Potential renters can view photos and floor plans of many of the apartments, as well as the name, address, and phone number of the property landlord or owner. Coldwell Banker Online

gives potential home owners the chance to search for private homes or business properties. You also can use the Mortgage Finder to estimate monthly payments on a property.

The Case

<http://www.thecase.com>

Keep your mind busy as you sit by the pool. Every week, The Case offers a different short mystery, which can be sent to you via E-mail or retrieved from the Web site. Read the brief situation, scan the clues, then try to solve the mystery. The solution is provided if you just can't figure it out yourself. These mind teasers aren't so tough that you'll lie awake worrying about them, but they'll occupy your brain for quite a while.

ZIA Free-Stuff Resources

<http://www.zia.com/free>

Everybody likes free stuff, and the ZIA Free-Stuff Resources delivers. With up to a dozen phone numbers, addresses, and Web sites listed daily, you'll never run out of samples, pamphlets, and other free information. If you really want luxury, give ZIA your name and E-mail address, and they'll send you the list daily.

Web-Tender

<http://www.pvv.vunit.no/~pallo/webtender>

Cool down during the hot and/or humid month of August with an ice cold drink from the Web-Tender. Choose a tasty libation from the database, add your own favorite if it's not listed, or have the Web-Tender suggest a drink for your next trip to the bar. Also, have your drink-mixing questions answered by the online Bartender's Handbook. ●

Compiled by Jeff Dadd

Is Your Image Safe With Dot Matrix?

While the high-pitched whine characteristic of the dot matrix printer is disappearing from store aisles, it still makes an impression on the eardrums of legions of home users. But are all the time and attention loyal dot matrix users put into their documents negated by the way the print lands on the page? It's important to know that even though most print jobs don't require the photograph-like quality available from some new printers, there are times when a dot matrix job is inappropriate.

A dot matrix printer's output quality is a major drawback to keeping the printer. This type of printer is called an **impact printer**, which means it forms letters by striking little pins against the printed page. The dots

merge in a form that's almost solid, but the white space between them makes the print appear faded. This method of composing letters with tiny dots also limits your font selection. Most prejudice against dot matrix is based upon the fact that the characters don't look as nice as smooth, solid characters. The difference is like that between a neatly hand-printed page and a typewritten one; no matter how well it's done, the dot matrix just doesn't have a finished air.

Because of its appearance, dot matrix hard copy might be a poor choice for some occasions. Just as you wouldn't wear jeans and a flannel shirt to a black-tie affair, you shouldn't send a dot matrix document out to make your best possible first impression. When sending out job applications or

résumés or preparing material for an important presentation, consider switching to a laser printer, either using your own or taking the file to a local copy shop to have the final version printed. Because a laser printer's copy is so much crisper and cleaner than that of the dot matrix, the print makes a much more professional impression. Prospective employers probably won't toss your cover letter and résumé aside simply because they're printed with a dot matrix printer, but it won't help you make the good, solid impression that might put you above the pack.

Keeping a dot matrix printer for a college student might seem like the perfect solution, but there are pitfalls in this plan as well. Professors, though generally more understanding of a student's financial limitations

Memory Lane

Ten years ago in computing . . .

Compaq's DeskPro 386 hit the market. The DeskPro contained an Intel 80386 processor with full 32-bit data processing. This simply meant that data could travel through the computer in groups of 32 bits, or four bytes. The 80286 processor, on the other hand, only could transmit data through the computer in 16 bits. The 386 effectively doubled the processing power of the previous computer model, and the Compaq DeskPro was the first popular example of its power.

Fifteen years ago in computing . . .

IBM unveiled its first microcomputer, the IBM PC, on Aug. 12, 1981. The IBM PC really brought personal computing to the mainstream and gave considerable credence to the idea that the average home could own a computer. Sales of the IBM PC were so good that IBM soon displaced Apple as the leading manufacturer of personal computers in the office, a position Apple would never regain.

Also in 1981, IBM released its new operating system, known as MS-DOS, for use with the PC. In a decision that has had monumental repercussions in the computer industry, IBM chose to market the operating system under its own name while allowing the fledgling software maker, known as Microsoft, to retain the rights to the operating system's programming code and market it under its own name, too.



On that warm August day in 1981, IBM practically crowned itself king of the personal computing market (at least for a decade or so), gave fiscal birth to a future billionaire (Microsoft CEO Bill Gates), and pulled the rug from under Apple's not-so-firmly planted feet. ○

than the professional world, may still ban the use of dot matrix printers for legibility reasons.

Remember the preference of the receiver when using a dot matrix for correspondence; dot matrix print can be difficult to read. While troubled eyes might appreciate dot matrix copy over sloppy handwriting, they would probably appreciate large, bold, crisp print all the more.

■ The Case For Dot Matrix

Just because dot matrix has drawbacks doesn't mean you should automatically ship your old unit to the scrap heap if you're thinking about upgrading your printing capabilities. The dot matrix printer can be cost-effective for users who do a lot of revision work and print rough drafts before printing the completed document. This system will probably work best with text-only documents because graphics don't usually print very well on dot matrix printers. The pin-against-paper printing method simply won't allow the resolution, or fine detail, necessary for most graphics images.

Using a dot matrix printer for rough drafts, text downloaded from online, or personal correspondence has decided price advantages. You can find a used 24-pin dot matrix printer at prices ranging from \$60 to \$80. Also, the cost of the dot matrix ribbons vs. inkjet or laser printer ink cartridges alone could make keeping a dot matrix for rough drafts worthwhile. New laser printers and inkjets have reasonable initial costs, but the price of the ink cartridges, at \$40 to \$80, adds up quickly. In contrast, dot matrix ribbons can be purchased for \$20 to \$50. (These prices are averages for home-user level printer models. Your specific printer and its supplies may have varying prices.) Inkjet cartridges, in addition to being more expensive than dot matrix printer ribbons, print fewer pages before running out of ink. You'll end up spending more money per trip to the store and having to visit more often. Using a laser or inkjet printer for rough drafts is like keeping a Porsche for trips to the grocery store.

Dot matrix has additional advantages beyond cost. Because it's an impact printer, it's the way to go for any kind of multilayered forms. Using a laser printer or an inkjet is like trying to write on duplicate checks with a felt-tipped pen. You'll get print on the first page, but the underlying sheets will be blank. Dot matrix printers have the power of the ball-point pen to carry the impression all the way through.

From Our Readers...

Dear PC Novice:

Where, oh where, can you purchase low-density diskettes nowadays? I have been through the San Diego yellow pages!

Jacque Christy/San Diego, CA

Low-density refers to any diskette that has a maximum storage capacity of less than one megabyte (MB). The most popular low-density diskette in use today is the 3.5-inch 720 kilobyte (KB) diskette, but many varieties of the low-density diskette exist. A high-density diskette, on the other hand, has a maximum storage capacity of more than 1MB. The 3.5-inch 1.44MB diskette is the most common diskette in use today.

Although high-density diskettes have gradually replaced low-density diskettes, many people still own computers that require low-density diskettes for data. This wouldn't be a problem for anyone except that high-density diskettes are incompatible with low-density diskette drives, and vice versa.

Fortunately, it's fairly simple to obtain low-density diskettes. Contact 3M Corp.'s Data Storage Markets Division at (800) 328-9438 to locate a distributor in your area. If the distributors don't have any low-density diskettes in stock, ask them to order some for you. Another option is to call Immac at (800) 547-5444 to request a mail-order catalog from which you may order the diskettes.

Incidentally, when diskettes first appeared in 1971, they were considered a vast improvement over the standard hard disk in use at the time. The diskette was smaller than the standard hard disk—8 inches in diameter rather than 14 inches—and it was made of a flexible plastic material instead of metal. In addition to their light weight, these plastic diskettes had another distinct advantage over the hard disks: Namely, the read/write heads in the diskette drive could press directly against the flexible plastic surface of the diskette without damaging either the diskette or the read/write head. The heads could access more data by touching the surface of the floppy diskette, so more data could be stored on the new medium, resulting in higher data density.

Send questions about old computers to:

Your Old PC
c/o PC Novice
P.O. Box 85380
Lincoln, NE 68501 (Volume prohibits individual replies.)

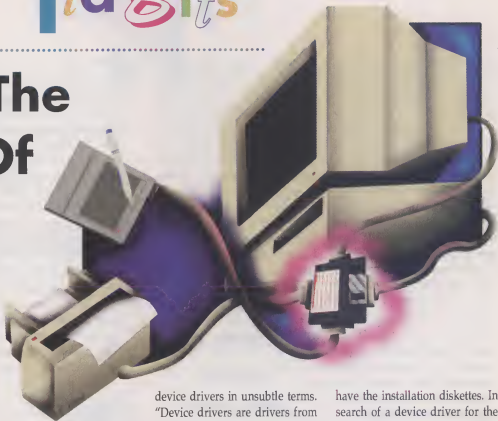
Another advantage enjoyed by dot matrix printers is the continuous paper feed. The printers feed the paper through in one long, perforated sheet that can be a little annoying to separate when producing long documents but works well for banners or forms that aren't a standard 8 1/2 by 11 sheet. A form that is 11 inches wide, but only 3.5 long, tends to confuse the printers programmed for only standard page sizes. With the continuous feed of a dot matrix printer, users can

make the adjustments within the application, and the printer will roll the paper through as commanded.

If you decide to hang onto a dot matrix printer, remember who will be receiving your handiwork before printing out the final draft. If you need quality, take the job to an inkjet or, preferably, a laser printer. Your image lies in the print. ●

by Elizabeth Panska

Behind The Wheel Of Device Drivers



When device drivers originally appeared on the computing scene, they were welcomed by computer users with open arms. At the advent of personal computing, hardware devices only were compatible with systems from the same manufacturer. Device drivers, which essentially are software applications that let different kinds of peripherals communicate with your computer and other devices, helped change that. They made PC hardware interchangeable and opened up a whole spectrum of third-party peripherals.

Unfortunately, device drivers caused headaches of their own, and few improvements have been made on them over the years. It seems as if these pesky translators are always bumping skulls with each other, and if any conflicts arise between device drivers, it can slow down or even shut down your system. And if you don't have the right driver for your piece of hardware, it may run sluggishly or not at all.

Windows 95 has been touted as the aspirin for our device driver migraine. But Win95 needs to open a lot of doors before Plug and Play becomes the standard,

not just some theoretical computopia where a hardware "wizard" can detect a new peripheral and install a driver for it without any complications.

A device driver is simply a program that translates for a device. The driver interprets general commands that it receives from the computer into the specific commands that a device will understand. For example, when a word processing program sends a document to the printer, the device driver translates the generic codes for page breaks, italicized text, and so forth, into the specialized codes that the printer will comprehend.

Some drivers, like the one for the keyboard, are built into the operating system that comes with your computer. But most of the drivers for such extraneous peripherals as monitors, CD-ROM drives, and printers must be loaded into the system each time you hook up a new device.

Russ Walter, author of the tutorial "The Secret Guide to Computers," sums up the complications that arise from working with

device drivers in unsavory terms. "Device drivers are drivers from hell," he says.

■ Downloading Drivers

"The main headache (from working with device drivers) is just not having them when you need them," Walter says.

Newly purchased devices come with installation diskettes that should take you step-by-step through the process of loading the drivers. But what if you lose the diskettes or purchase used equipment that has no diskettes? You can call the company and get replacements, but they may charge you, and it will probably take at least a few weeks to get them.

One option you can fall back on, if the company is large enough, is downloading the drivers from the company's bulletin board system (BBS) or World Wide Web page. This also is a good way to get upgraded drivers that can help your hardware run faster and more efficiently.

We obtained a Hewlett-Packard DeskJet 340 portable printer and pretended that we didn't

have the installation diskettes. In search of a device driver for the printer, we logged onto the Web via Netscape Navigator 2.0 and opened HP's home page at <http://www.hp.com>. This gave us HP's general information page, which showed us several broad categories of HP information. Because we were looking for a printer driver, we followed the hyperlink labeled Products. In most Web browsers, you can follow a link (a pathway to another Web page, usually represented by highlighted text or an icon) by clicking it.

There were a lot of categories on the Products page, but we figured the one that we wanted was Services And Support. (Most companies will have a link labeled Drivers, Technical Support, Downloads, or Services And Support that will take you to their downloadables.) We followed three more links (Peripherals, Printers, and HP DeskJet Portable/HP DeskJet 300 Series) and finally arrived at a page with dozens of downloadable files, each with a short text description.

We downloaded the English version of the executable file

containing the latest driver for our DeskJet 340 (this was version 7.0a—the one that came on diskette with the printer was only 6.0), as well as several text documents that gave a description of the driver, system requirements, and installation instructions. (There was even a set of instructions on how to reach HP's Poison Control Center in case someone had injected printer ink from an ink cartridge. HP takes care of its customers.)

The executable file (executable files contain the suffix .EXE and need no other applications to run them) was fairly big. It contained 1.24 megabytes (MB) of compressed information and took about 20 minutes to download with a 28,800 bits per second (bps) modem. (A 14,400bps modem would take about twice as long.)

We placed our file, called Dj345en.exe, in its own folder (we called this folder HP 340) and then ran it. Windows 3.x users can select Run from the File menu and then Browse to the executable file. Win95 users can select Run from the Start menu or double left-click the executable file icon.

After the file inflated its contents, we ran the Setup.exe file (in the same fashion), which walked us through the installation process. The toughest part of this stage was clicking the right printer number (340). We then were ready to communicate with our printer.

NOTE: Win95 users need to select Add Printer from the Control Panel and follow the instructions found there to finish the installation.

■ Updating Drivers

We mentioned before that the driver that came with our printer was only version 6.0 and that the one we downloaded from HP's Web page was version 7.0a. Most of the time, upgrading to a higher version of a driver will make improvements in the performance

of your hardware. Upgrading is almost always a good thing.

We say "most of the time" and "almost always" because in certain cases, upgrading may not be beneficial. What you need to look for in an upgrade are new developments for your specific system. If an upgrade will not help out with problems you are having or make improvements for your operating system (OS) or hardware, it won't do any good to upgrade.

**The new
Windows 3.1
version
gave us the
option to print
from DOS
applications
through Windows
as well as
making
the print spooler
and print status
monitor
run more
efficiently.**

The documentation that comes with a new driver (either in a box or off the Web) usually will have a New Features section or something similar. Our new version (7.0a) offered some major improvements over the older version:

- Win95 support—The driver version 6.0 would have been unable to run the printer from a Win95 OS. The new driver also gave us support for our **infrared serial connection** (wireless connectivity that uses infrared beams, such as in remote controls) in Win95.
- New Windows 3.1 benefits—This version gave us the option to print from DOS applications through Windows, as well as making the **print spooler** and print status monitor run more efficiently. (A print spooler is a program that holds output from the computer on the hard drive or in memory until the printer is ready to receive it.)

■ Win95 Or Lose95?

"In Windows 95, the problems (with device drivers) sort of go away because in Windows 95, if you buy some new device—a sound card, a scanner, or something else—you're supposed to be able to just click on an icon called Add New Hardware, and it will find a device driver for it and take care of everything," Walter says. "That's what's supposed to happen. In reality, since we're still in transition to 95, sometimes things don't always work that way."

We thought we'd give Win95 a chance to live up to this Plug-and-Play claim. We erased the driver and all the other programs for the HP 340. We entered our Control Panel and left-clicked the Add New Hardware icon. The New Hardware Wizard searched diligently for several minutes and found only our mouse and our modem—peripherals we already had configured drivers for.

Win95 also gives you the option to configure the driver yourself by choosing one of the drivers that are built into the OS. We picked Hewlett-Packard off

the list of printer manufacturers, and the Wizard said it knew how to configure a driver for our DeskJet 340.

Unfortunately, Win95 didn't have this driver built in. After we selected the 340, Win95 asked us to insert the HP DeskJet Installation Disk 1. Our installation diskette had version 6.0 (for Windows 3.1 or DOS).

Undaunted, we tried again. Under HP drivers, there was a generic driver labeled HP DeskJet Portable Printer. We selected this and inserted our Win95 CD-ROM as asked. This time, the Hardware Wizard was successful. It configured the driver and even printed out a test page, which described the driver and our printer settings. This driver was version 4.0. It had none of the fancier options, such as the print status monitor or the infrared serial connection, but it worked.

"The problem with Win95 is if something ever does go wrong, you don't know what the heck's going on," Walter says. "At least with the old system, you could look in Config.sys and Autoexec.bat (files that contain OS and device driver commands) and after asking a bunch of friends questions, you could figure out what to do."

Win95's Plug and Play is promising, but until every new piece of hardware is designed with it in mind, computer users will remain in the device driver seat. ●

by Joel Strauch

For More Information:

DeskJet 340
Hewlett-Packard
(800) 752-0900
(408) 553-5300
<http://www.hp.com>



Need help with your hardware or software?

Looking for simple explanations on technical subjects?

Send us your questions!

DOS

DOS COMPUTING

Q: I just installed the MS-DOS 6.22 upgrade. Now when I boot up and start Windows, the following message appears: "The Microsoft Windows 32-bit disk driver (wdctrl) cannot be loaded. There is unrecognizable disk software installed on this computer. Check if address that MS-DOS uses to communicate with the hard disk has been changed."

A: One reason you're getting that message could be a boot-sector virus. Use a good virus scanner to see if your hard drive is infected. If you do find a virus, don't forget to scan all your diskettes as well, including the upgrade diskettes, which (even if they were clean to start with) may be infected by now. If you don't do this, the diskettes may re-infect your hard drive later. You also should try to figure out where you got the file or diskette that had the virus and inform that person right away. This is even more important if you downloaded the upgrade kit for MS-DOS from an online service, and this file contained the virus. Why? Because the service is unknowingly spreading the virus around, and its system is at risk, too.

You also could be getting this error message because you have the line "Device="WDCTRL" more than once in the [386Enh] section of your System.ini file. Remove one of the occurrences and see what happens.



WINDOWS 3.1

Q: I recently turned on the faster 32-Bit File Access (32BFA) mode in my Windows for Workgroups (WFW) virtual memory section in Control Panel. After I did so, WFW would not start at all. When WFW does start, the screen goes blank (before the Windows logo even comes on), and my computer reboots! After trying, and failing, to find a line in my System.ini file that would let me manually turn off 32BFA, I finally got back in just by restoring my System.ini file from a recent backup tape made before I turned 32BFA on. My question: If other readers were in this same boat and didn't have a backup, what other options (short of re-installing WFW) would they have for getting back in to turn off 32BFA?

A: They could start WFW with the command line win /d:c. This will disable the 32BFA during bootup. They then could go back to their Virtual Memory setting to disable the 32BFA permanently. (You can type win /? at the command line to see further troubleshooting "switches" you can use when starting Windows.)

But why would you want 32BFA in the first place? 32BFA and 32-Bit Disk Access are faster ways for Windows to run your hard drive. 32BFA in particular can give dramatic improvements, but, as you (and many other letter writers) see, it sometimes can be hard to activate or may cause incompatibilities with some software. Our advice: If you can easily get 32BFA running and your system seems reliable, by all means use it. However, if it gives you any problems at all, disable it and forget it; the speed gains often aren't worth the hassle, time, and loss of reliability.

We can think of one reason you might be having trouble starting 32BFA. Look under the [386Enh] section of your System.ini file (in your WINDOWS directory) using any editor and see whether you have a line that says, "NOEMMDriver=True" there. If so, change it to read "Emmsize=0" and see whether your luckup goes away.



Start

WINDOWS 95

Q: In Windows 3.1, TrueType fonts always have at least two files: a .TTF font file and an accompanying .FOT file. I think I heard that in Win95, the font files ending with .FOT (such as Arial.fot) are no longer needed. Since my 800-plus .FOT files in my soon-to-be-upgraded-to-Win95 computer occupy more than 16MB of space, this could be good news. My questions: (A) Is this true? Do TrueType fonts in Win95 not use the .FOT files? (B) If so, would they be automatically removed during the Win95 installation? (C) If so, how can I prevent older software that comes with TrueType fonts from continuing to install .FOT files in the future?

A: You're right. Win95 needs only the font's .TTF file, and it puts the extra font information that is needed inside the Win95 Registry. When Win95's setup is run during the upgrade from Windows 3.1, all entries in the [fonts] section of Win.ini are entered in the Win95 Registry and then deleted out of Win.ini.



WINDOWS 95 (CONT.)

The install normally deletes the old .FOT files when it's done. You can't prevent older programs that come with extra fonts from later copying .FOT files to your hard drive along with the needed .TTF files. So the .FOT files may appear in Win95 briefly when an install of an old Windows 3.1 program stuffs them in there. But don't worry: When fonts are added to the system by older software (and entered in the [fonts] section of Win.ini), the next time Win95 boots, your new settings are moved to the Registry, and the added .FOT files are again deleted. Win95 even moves the .TTF files into your Fonts folder where they belong.

Q: Normally, if a user holds down the F5 or F8 keys during Win95's startup, it will interrupt the normal startup and allow certain kinds of diagnostics and other options such as "go to DOS." But I don't want other people using my computer to be able to do that and bypass my startup routines. I seem to remember a way to disable these F5 and F8 boot-interruption keys. Am I dreaming? I looked in the Microsoft Windows 95 Resource Kit and didn't find anything.

A: Look on page 204 of your Win95 Resource Kit. In Win95, the Msdos.sys file is a user-editable file for setting certain advanced options, including the startup option you want. The file is in the root directory (C:\MSDOS.SYS), and because it contains important (but rarely needed) settings, it's a hidden, read-only file. You'd have to use Explorer (or the DOS ATTRIB command) to remove the hidden and read-only properties to be able to open it in Notepad or another editor and change it. It says to set, or add, the line `bootkeys=0` to the Msdos.sys file. ("1" means turn on; "0" means disable the feature.) You'll notice a bunch of other interesting options there, too. Here's what some of them mean:

```
BootDelay=initial startup delay
BootFailSafe=enables safe mode start
Boot GUI=normal boot
BootMenu=enables automatic display of Startup menu
BootMenuDefault=sets default menu item on Startup menu
BootMenuDelay=# number of seconds until
                    default item is run
BootMulti=enables dual-boot capabilities
BootWarn=enables Safe Mode startup warning
BootWin=makes Win95 the default operating system
```

1,032MB hard drive into two partitions, each less than 512MB. My question, which you didn't address, is now that I did it wrong, can I go back and repartition after having loaded about 200MB of programs? Or must partitioning only be done to an empty drive?

A: Normally, repartitioning with the ancient FDISK utility in DOS must be done with an empty disk (at least it does if you care about your disk's contents) because in the partitioning or repartitioning process, everything's zapped clean. But there's an excellent third-party utility (PartitionMagic by PowerQuest Corp., 800/379-2566) that can repartition without destroying programs and data. It also offers other neat tricks such as changing the cluster size for more efficient storage and alternately making a Windows 3.1 and a Win95 partition into the "active" partition (useful for people wanting to run both Windows 3.1 and Win95 on the same hard drive).

Q: I bought a new monitor that (according to the manual) is supposed to have the new, power-saving "green" features. This feature is supposed to put the monitor into a low-power standby mode if I walk away from the computer for, say, 10 minutes. But it doesn't do that and has no settings on it or directions with it on how to make it do so. The dealer says it only can do that if it's plugged into a new "green" computer. Is that true?

A: No. But it is true that the monitor's ability to go to "sleep" does depend upon it getting a signal saying "no one is using the screen or keyboard; it's OK to go to sleep" from somewhere outside of the monitor itself. One place that signal can come from is the BIOS (setup) routine of a newer "green" (energy-aware) motherboard. Indeed, if you have a "green" motherboard, getting into its BIOS setup routine should be your first choice in activating your monitor's power control. (For more information on changing your BIOS, see "System Setup" in the July 1996 issue of PC Novice.)

A second way to send this signal occurs if your video card has "green" features built in. It may come with software that tells it how to signal the monitor to go to sleep. And if you're running Win95 and tell it what monitor you own and check the box saying your monitor is Energy Star Compliant, the operating system may be able to control your monitor's power consumption.



COMPUTER HARDWARE

Q: I have a Tandy 486SX/33 OMNI Profile computer. I wanted to get the CPU upgraded to something faster. Radio Shack quoted me a price about twice as high as I see in the computer ads elsewhere, for either a DX2/66 CPU chip or a DX4-100 OverDrive CPU. Can I use the cheaper non-Tandy product in there?



UTILITIES

Q: I enjoyed your recent special newsstand publication, PC Novice Guide To Upgrading. I was surprised to see on page 23 that I'd have saved myself a lot of useful disk space by partitioning my new Seagate



COMPUTER HARDWARE (cont.)

A: Maybe. It depends upon the socket you have for your CPU. If the present 486SX socket is not soldered in, you're in luck. But be sure that any DX4 or DX2 CPU or OverDrive you put in there is specifically rated to run at 5 volts. Many CPUs only will run in newer 3-volt boards and will simply burn out if stuck into your socket. Tandy computers are designed in proprietary (different from standard) ways that sometimes make it difficult or impossible to do repairs/upgrade without a Tandy shop and high prices. Most of the reputable independent repair/upgrade facilities we called said they wouldn't even touch a Tandy computer. We suspect that making systems proprietary is at least partly a deliberate policy to allow Tandy to charge higher prices for parts and service. To be fair, this isn't just a problem with Tandy; Packard Bell, Compaq, and even some Dell PCs have this flaw. Folks rarely think about this when buying their computers, but we'd hesitate to buy any PC that has a motherboard, power supply, or hard drive that can't be exchanged for a "generic" one.

Q: *I'm trying to figure out whether my 486 computer will accept the Pentium OverDrive CPUs that Intel makes. I do have the extra rows of pins in the socket. Is the "PT24" that my owner's manual lists as a compatible CPU actually the OverDrive?*

A: Yes. Your manual was written before the OverDrive CPU you're talking about existed. What Intel used to call the PT24 (before it was actually in production) is today called a "Pentium Overdrive CPU for the 486."

Q: *My local computer store told me that faster memory automatically yields faster performance, but wouldn't I have to get into my computer's BIOS/CMOS setup and shorten wait states to affect that?*

A: You're right. Putting in more expensive, 60 nanosecond (ns) RAM where the computer requires only the slower 70ns RAM will by itself do nothing for your performance. As for getting into your CMOS setup, unless putting in the faster RAM actually lets you get away with shortening some wait-state settings in your BIOS, it still won't help. Besides, the few times we've succeeded in reducing setup's wait states without crashing our computer, the speed gains have been pitifully poor. And anytime you shorten your wait states, you run the risk of making your computer less reliable or even having it lock up. We DO NOT recommend that you mess with your computer's wait-state settings unless you really know what you're doing.

If you're talking about overall speed in Windows, you'd do far better spending your money on one of the following

options. If you have less than 8MB of RAM, simply add more RAM. If your IDE disk controller (host adapter) is not a modern EIDE (Fast ATA) type (as is the case in most pre-1995 motherboards/systems) but your disk is newer than 1992, chances are your disk, if hooked up to an EIDE host adapter, is capable of running much faster. For about \$30, Data Technology Corp. (408/942-4000) makes Enhanced-IDE host adapters. That could really put a fire under your disk.

If you have an old 25MHz or 33MHz 486, Kingston makes a pop-in upgrade CPU (TurboChip 133) that would quadruple your CPU performance. And it sells for \$139. Why screw around trying to tweak 15% out of your RAM timing?

Q: *I have a friend who uses a Macintosh, and when I recommended he get a tape backup drive for his 340MB hard drive, he told me that they're too expensive on Macs and that he'd have to get a Zip drive instead. I see all sorts of tape drives with about 1,000MB capacity for less than \$200 in ads. Won't those work on his Mac? And is a Zip drive a good backup?*

A: Even Mac fans (at least the knowledgeable ones) admit that low-cost tape backup is one area where PCs have a marked advantage over Macs. On a PC, most tape backups connect either to the existing floppy controller or the IDE hard disk controller, saving big bucks because the tape drive doesn't need a controller of its own. In addition, most Mac tape drives are external models that need their own case and power supply. Finally, Mac tape drives have to be the more expensive SCSI type. The result? It costs about \$700 to get a tape drive for a Mac.

Zip drives are great. Their one weak point as backup devices is that since each diskette holds only 100MB, you can't (as you can with tape) command a "full backup" to start, leave for lunch, and find it done when you come back for hard drives larger than 100MB; you have to sit there feeding it Zip diskettes.

Q: *I was about to get a tape backup drive, but I heard about something called "mirrored hard disk" that sounds even better. Where can I get one, and what are their pros and cons?*

A: Until recently, we'd have said, "Forget it; they cost thousands." But now Data Technology Corp. makes a mirroring controller called HardCopy for around \$180. You can order the product through Midwest Micro at (800) 862-5622, ext. 5127.

Mirrored hard disks seem like the ultimate built-in safety net: A second hard disk continually updates itself with a mirror image of whatever is on your primary disk. If either disk fails, the other has an up-to-the-second backup and instantly takes over. This is great if you're running a system (such as a voice-mail reservations computer) you simply can't afford to have down for the hours it'd take to replace a disk and restore from tape backup. If you hard



COMPUTER HARDWARE (cont.)

disk truly breaks (a dead or totally unreadable disk), a mirrored disk is excellent.

But the security of mirrored disks is sometimes an illusion; they most definitely aren't a substitute for tape backup. Their very ability to instantly copy changes is also their Achilles' heel. For example, if you save an unreadable file to your primary disk, the mirrored hard disk faithfully copies the corrupt file onto the second disk. If a virus wrecks data on your primary disk, the mirror system happily spawns viruses and virus damage onto your secondary disk. And of course, if your computer is stolen or burned, you can kiss your bytes goodbye. The irony is that occasionally the illusion of complete security that mirrored disks suggest sometimes stops users from keeping adequate real (external) backups. We suspect that within a year or two, we'll see some inexpensive disk-mirroring controllers that are intelligent enough to know when *not* to copy your main disk.



WORD PROCESSING

Q: *Ami Pro often opens several documents at once and "hides" one behind the other. Is there any way to force it to close down the ones I'm finished working with?*

A: Yes. Closing unused documents is particularly important if you don't have a lot of RAM on your system. When you use the File/Open dialog box just before you open a new file, look for a little check box called Close Current File and make sure it has an X in it. One fly in the ointment: Some of Ami Pro's macros and special SmartIcons (such as your Print An Envelope icon) "unchecked" that box without your knowledge or consent, so you may have to occasionally recheck it. Also, see our answer to the next question.

Q: *When I run my Microsoft Word with several open documents, I find it confusing to keep track of what I have open (especially when the "front" document is occupying the full screen and hiding the others). Isn't there some way to tell Word not to open more than, say, two documents at a time?*

A: Not that we know of. But a great way to work efficiently with multiple documents open and be less confused about "which document is where" is a tip that works with almost any Windows word processor and, in fact, with most Windows programs that allow several open windows.

Word, like most Windows word processors, lets you have many documents open simultaneously, each in its own window. In fact, it's easy to unintentionally end up with several open documents without even noticing you've done so. It's a bit cumbersome to move among them by using

Word's Window menu, and if you Tile or Cascade (to let you see them all at once), none of your documents are in a decent size/format window for working. But there's a neat, though poorly documented, hotkey for toggling among open documents in most word processors. Just hold down the CTRL key and repeatedly press TAB. You'll rotate through all of your open documents, changing windows each time you hit TAB. When you see the one you want, release the keys. (If this combination doesn't work, try CTRL-F6.) This works essentially the same way that Windows' own useful ALT-TAB does, rotating you among open programs.



PRINTERS

Q: *I just installed an HP-5L printer in place of my old HP-IIIIP, and it lacks the front panel controls and LCD status display my old IIIIP had.*

Hewlett-Packard tells me that the reason its printer status-reporting and control software (that's supposed to replace the old LCD) won't work on my PC is that I don't have "a bidirectional printer port." So, even though the printer basically works, I have less information about my printer's status, and a little less control of it, than I did on that little LCD panel on the front of my old IIIIP. What can I do?

A: The newer HPs have moved away from having front panel controls for things like setting the default font; instead, they use software to do that. We're not sure this is progress. For the software to control and report on the printer, the printer port must send information both to and from the printer, i.e., be bidirectional. If you have a connection to your printer other than a plain bidirectional LPT (printer) port, the software can't work. Many older PCs have printer ports that aren't bidirectional. (And if your printer's connected to your computer through a network or a printer sharing box, it probably isn't a bidirectional connection.)

There's one chance for you. It's possible that your printer port is actually bidirectional, and it's your printer cable that isn't. Buy a printer cable that says "bidirectional." If you're lucky, that will solve the problem. If you really do need a bidirectional port, check our March 1996 Q&A column under Computer Hardware, where we listed some suppliers of fast ECP-type parallel add-on ports/cards. Though a port doesn't have to be an ECP/EPP type to be bidirectional, these new, fancier ports are also virtually always bidirectional. ●

Get straight answers to your technical questions. Ask PC Novice! Send your questions, along with a phone and/or fax number so we can call you if necessary, to: PC Novice Q&A, P.O. Box 85380, Lincoln, NE 68501. Please include all version numbers for all software about which you're inquiring, operating system information, and any relevant information about your system. (Volume prohibits individual replies.)

ACTION



EDITOR

When Ralph Nader can't be reached, bring your computer service problems to our Action Editor column. This page will help you find products, resolve service problems, and keep manufacturers alert to the critical issue of customer relations.

Are you having trouble finding a product or getting adequate service from a manufacturer? If so, we want to help solve your problem. Send us a description of the product you're seeking or the problem you've had with customer service. In billing disputes, include relevant information (such as account numbers or screen name for online services) and photocopies of checks. Include your phone number in case we need to contact you. Letters may be edited for length and clarity; volume prohibits individual reply. Write to:

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Dear Action Editor:

The smartest thing I've done in computing is ordering my two-year subscription to PC Novice. The dumbest thing I've done is believing the hype about Micron computers. I ordered a P133 Millenia two months ago.

The first month, I had to have the power supply and 6X CD-ROM drive replaced. I asked for a refund, still being within their 30 days for a refund. I was assured everything would be fine. Now the 17-inch MAG monitor is dead. I waited on the phone for an hour for technical support. I finally got through and was lamenting the fact that I had previously owned a Gateway for five years with no problems. The technician told me that he wouldn't help me since I was so happy with Gateway!!

What's happened to the phrase, "The customer is always right?"

Larry Robinson
Joliet, IL

About one week after we contacted Micron, the company had shipped Larry a new monitor. After a tech support representative contacted him and discussed his system's problems further, it was determined that he also needed a new motherboard. About a week after he received the monitor, a motherboard was shipped to him, and a service technician arrived at his home a few days later to install it. Larry told us the system was functioning properly and that he was pleased with the new warranty, which started at the new motherboard's installation.

Dear Action Editor:

I need a legal copy of WordPerfect 5.1+ to replace an employer-provided copy so I can terminate my work and maintain use of the best word processing software ever developed (in my humble opinion). I have no wish to upgrade to any other version. It seems counterproductive to learn a new, slower, more Windows-based word processing package when there's a product I am already proficient in that works very effectively in the DOS environment and with which I am extremely comfortable.

I'm extremely annoyed by the runaround I was given by Novell and Corel. My question is this: Do you have any idea how I can find and purchase a copy of WordPerfect 5.1+? I need the "plus" version for a specific reason. If you can help me find someone with an old, unopened copy, I would be most appreciative.

Teresa Cooke
Chattanooga, TN

We found a copy of WordPerfect 5.1+ at Recycled Software (800/851-2425, 702/655-5666) for \$129. Teresa ordered a copy; when it arrived, she said it appeared to be brand new.

Dear Action Editor:

Please let me know whether there is a German version of a spell checker. This would be for Windows 95, Microsoft Word, and Microsoft Works.

Walter Haecussler
Mill Valley, CA

Microsoft recommends Microsoft Proofing Tools from Alki Software (800/669-9673). These packages recognize what language you're using and apply the appropriate spelling, hyphenation, and thesaurus files. Languages offered include Danish, Dutch, Finnish, French, German, Italian, Spanish, and Swedish.

Corel offers a large assortment of foreign language modules for WordPerfect 6.1 at (800) 772-6735 for about \$15. Included languages range from Czech to Icelandic to Ukrainian.

Lotus offers spell checkers for Word Pro in more than 50 languages and dialects at (800) 343-5414. A price had not been set for the modules when PC Novice went to press.

For information on more multilingual software, try the Multilingual PC Directory on the World Wide Web at www.knowledge.co.uk/xxx/mpcdir/book.htm.

Dear Action Editor:

After reading horror stories about bad service from PC dealers, I couldn't keep from writing. My experience is one of great satisfaction. I had my PC built to my specs by a local outlet of ACRO computer sales.

Since then I have had two upgrades done by them plus numerous visits to them seeking information. I pay just slightly above what the discount chains charge for comparable products, but in return I talk to a knowledgeable individual who is familiar with my setup and cares what happens to it. I guess my point is that price is not the only consideration when purchasing a computer.

Bob Ridosh
Henderson, NV

While Action Editor usually deals with service headaches, we're also glad to hear from satisfied buyers. As Bob points out, remember that computer superstores aren't the only option. ●



GLOSSARY

Of Terms

Association—A link created between an application and a data file that allows the data file to be opened and manipulated by the application. Usually, a three-letter file extension is used to designate the files that are linked to a certain application. For example, *Microsoft Word* will open any data file with a .DOC file extension.

Bandwidth—The amount of data that can be transferred over a communications line in a certain amount of time.

CD-E—CD-Erasable. Also known as CD-rewritable, this compact disc technology lets users write (or store) their own information on discs. CD-E material can be written to, erased, and rewritten to thousands of times, as opposed to CD-R media, which only can be written to once. CD-E drives can play and write to CD-E and CD-R discs and can retrieve information off CD-ROMs.

CD-R—CD-Recordable. A compact disc technology that lets users write (or store) their own information on discs using a CD-R drive and disc. The disc material only can be written to once, although you can come back and store information in numerous sessions. CD-R drives can play ordinary CD-ROMs and CD-R discs, and CD-R discs even can be played in CD-ROM drives.

CD-ROM—Compact Disc, Read-Only Memory. A form of data storage that uses laser optics rather than magnetic means for reading data. CD-ROMs only can be read by a CD-ROM drive; they can't be written to.

Config.sys—A text file that DOS consults at system startup. This file contains commands that tell DOS how to communicate with new hardware, customize communication with existing hardware, or adjust your computer's memory usage.

CPU—Central Processing Unit. The "brain" of the computer. The type of CPU, or microprocessor, that a computer has determines what type of system it is. The 80386, 80486, and the Pentium are all processor chips, or CPUs.

Default Printer—The printer where documents are automatically sent when they are to be printed.

Device Driver—Software that is designed to control a particular hardware device, such as a monitor or printer. These drivers act as go-betweens for programs and devices, ensuring the devices understand the software's commands.

DVD—Digital Video Disc. A new type of storage technology for high-density discs that can hold from 4.7 gigabytes (GB) to 17GB of information. A DVD disc would be capable of storing a full-length film.

dpi—Dots Per Inch. A measurement of the resolution of printed images. The more dpi, the higher the resolution and the sharper the image.

ISDN—Integrated Services Digital Network. A type of online connection that speeds data transmission by handling information in a digital form. Traditional modem communications translate a computer's digital data into an analog form before sending it across phone lines. The data then is translated back into digital form on the receiving end.

GB—Gigabyte. A unit of computer storage equaling approximately one billion bytes.

MB—Megabyte. A unit of computer storage equaling about one million bytes.

Microprocessor—An integrated circuit containing all the central processing functions of a computer; also called a central processing unit (CPU).

Print Spooler—A program that holds output from the computer on the hard drive or in memory until the printer is ready to receive it.

RAM—Random-Access Memory. The temporary memory storage area used to load program instructions and store files currently in use. Unless a file is permanently

stored on a hard drive, diskette, or other storage medium, changes to information stored in RAM will be lost when the computer is turned off.

Reboot—To restart the computer. Often, you must reboot your computer during the setup of a program or hardware device for the new settings to take effect.

Resolution—A measurement, usually in dots per inch (dpi), of the sharpness of an image generated by a printer or monitor. Higher resolutions yield clearer images; lower resolutions make images appear coarse and out of focus.

Root Directory—The directory in a hierarchical directory scheme from which all other directories stem. A directory is an organized catalog of the files and smaller directories, called subdirectories, contained in a storage device.

Scanner—A photocopier-like device that uses light-sensitive equipment to read a document and translate it into digital information that can be used by the computer.

SCSI—Small Computer System Interface. Used for connecting a computer to peripheral devices (such as CD-ROM drives or printers), other computers, and local-area networks (LANs). Peripheral devices are attached to a single SCSI port through a series of connections called a daisy chain. Each device is assigned a priority number. Transmissions through the port only occur one device at a time, and peripherals with the highest priority number are the first in line for transmission.

SIMM—Single In-Line Memory Module. Small circuit boards that accommodate memory chips. Smaller than traditional memory hardware, these boards use less space on the motherboard.

Thermal Printer—A printer that uses heated pins to "burn" images onto heat-sensitive paper.

6 Ways to Maximize Your Potential With a PC

OK. You've got your PC up and running. So why is it that you find yourself multitasking more often than your computer? System configuration, learning new applications, hardware upgrades — wasn't this thing supposed to make your life easier?

As you've probably realized, getting the most out of your PC is going to take some time and effort. The question is, are you going to learn how to do it the easy way or the hard way?

The hard way involves a lot of system lock-ups, error messages, and incomprehensible manuals that seem to have been written in some kind of Ph.D. code. Not to mention the joy of holding the line for the next available service representative.

The easy way is...well, easier. Step-by-step instructions about the specific topics you're interested in. "Hands-on" exercises that give you the practical experience you need to master PC skills. Lessons written in plain English — not "technobabble."

Where can you find this easy way to learn PC skills? Actually, it's sent right to your home. It's ICS *distance education*, and it's been the educational method of choice for millions of busy adults who wanted improved skills but didn't want to waste their time and money.

ICS offers a variety of fascinating and useful programs that you can take at home in your spare time. There's no need to rearrange your schedule or travel to class when you study the ICS way! Your "class schedule" is as flexible as you are.

But just because you study at home doesn't mean you're alone. ICS has a trained and experienced staff of instructors who are just a toll-free phone call away. You can also get in touch with the school via their web site, at <http://www.icslearn.com>

Here are five specialized at-home training programs offered by ICS, plus another program for beginners. If you wish to find out more about ICS training, contact ICS at the phone number or address listed at the end of this page for a FREE information package.

1. PC Repair

Learn the skills you need to repair and upgrade your PC for a fraction of what it would cost at a repair shop. This fascinating, step-by-step program teaches you everything from preventive maintenance to software diagnostics. Plus, you also get A+ Certification exam preparation — so you'll be ready to take the certification test that's fast becoming the standard for PC Repair Technicians across the country. In fact, the PC Repair Program is so comprehensive that you'll be able to use it to make extra cash upgrading or fixing PCs for people in your neighborhood. And, of course, you'll save plenty of time and money on your own repairs.

2. PC Specialist

Get "up-to-speed" with essential home and office software applications. The ICS PC Specialist Program gives you an overview of word processing, databases, spreadsheets, and telecommunications. Then you put your lessons into real-life practice using the Microsoft® Works™ software ICS sends you! Complete your training in as little as six months, and keep the software forever.

3. Computer Programming

Learn valuable programming skills in just a few short months. Start toward an exciting new computer career, advance in your present job, or just use your programming skills to help you better manage your home computing tasks. Choose from 3 different training programs: Programming in QuickBASIC® Visual Basic Programmer•Visual C++ Programmer.

4. Applied Computer Science

Get comprehensive computer knowledge and earn your Associate in Specialized Business Degree in just two years — without setting foot in college or tech school. This four-semester degree program teaches you about business computer applications, systems design, programming, systems analysis, management information systems, and more.

5. Desktop Publishing

Get skills that you can use to design and produce your own invitations, holiday greeting cards, newsletters, and much more. Step-by-step lessons teach you the principles of Desktop Publishing, and then you get practical exercises using

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The school will send you free information and a color brochure about the training program you're most interested in. There's no obligation, so contact ICS today!

A Stranger Among Us

The World Still Wonders What To Make Of The Internet

The Internet phenomenon sometimes seems as simple as one of the stainless steel space capsules that crashed into farmers' fields in cheesy '50s sci-fi movies. As townspeople gathered around the glowing pod half-buried among stalks of milo, they could immediately tell it was exciting and powerful. But they wondered whether it was dangerous, and they were certain they didn't know how to handle it.

The 'Net-savvy folks of the '90s like high-minded talk about online possibilities and Information Superhighways. But behind the elaborate business plans and Web browsers, we're all basically rubes in overalls peering into a glowing crater. The whole crowd (from end users to company executives to journalists) knows there's a lot of power in this 'Net thing, but we keep circling, wondering how to approach it, how it will affect society, and what will happen when we start working with it in earnest.

One of the fundamental barriers to 'Net insight is that no one has had an epiphany into how the darned thing compares to anything we're familiar with. The spacecraft metaphor might put the Internet phenomenon in context, but it does little to explain the very structure of the 'Net. Some say the Internet's kind of like a prairie dog town in that there are dozens of paths leading off in all directions, and you can never see around the upcoming curve. Maybe it's like public access television in that virtually anybody can have a voice on it and virtually no one is listening to most of it. Perhaps we could even compare it to a 19th-century American land rush where everyone races to claim a piece, then realizes they own a chunk of desert that nobody will visit until some rich guy builds a railroad or town nearby. The best analogy, for now, is probably some amalgamation of all these and more (including the eminent "World Wide Web").

But regardless of how perplexed the average mouse jockey may be by the 'Net's nature, it's probably minor compared to the angst of executives betting their future on finding a way to capitalize on the Web before the competition does.



Plenty of big companies apparently think the 'Net is really like a cocktail party: It's imperative to show up even if you don't really do anything when you get there. Considering that only about 8% of American households use the Web, it seems that firms' promotion of their Web sites in TV and print ads is really just hedging against the day when Joe Sixpack may actually understand and care about those funny "http:// " things. Chronic 'Net-induced tension plagues the headquarters of online services. If the world's information is available on the Web for a low monthly fee, consumers wonder, why pay for the same data on an online service? What unique content, online service execs wonder, will draw users into our fee structure? Telephone company

big shots are also losing plenty of sleep as they mull over consumers making free phone calls on the 'Net.

Even ignoring metaphors and profit potential, most of us still struggle with the 'Net idea because we can't even decide whether we like this overwhelming tide of information pouring through our computer. One day, you've had it with slow links and lame Web sites. The next day, you find the rough draft of the Declaration of Independence and a great commentary online in two minutes. Maybe this is the way to work in the future, you think. This is the information clearinghouse where anybody can express their opinion! Then you're appalled by a pornographic posting and start hating that stinking 'Net again.

A lot of people are trying to decide whether they should fear the Internet. (OK, some people *know* they should fear it, but they probably also have a year's worth of dehydrated food in backyard bunkers.) Can kids go online without encountering online predators? Can credit card numbers? Does the vast storehouse of information online mean no one's privacy is safe? In the end, answers to these questions, rather than talk of prairie dog holes and land rushes, will occupy the thoughts of Internet observers and help them decide whether to embrace this new power or call out the National Guard. ●

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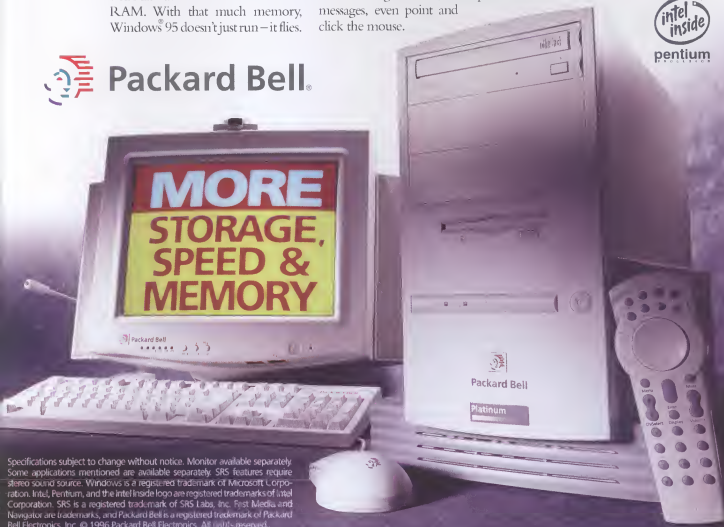
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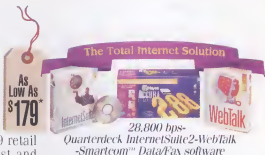
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